IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ROME DIVISION



IN RE: TRI-STATE CREMATORY LITIGATION

DOCKET NUMBER: 1467

PLAINTIFFS' RULE 26(a)(b) EXPERT DISCLOSURE OF AI ENVIRONMENTAL CONSULTING SERVICES

-1-

Plaintiffs disclose Luis Llorens, Bruno Ferraro and Douglas W. Bauman as testifying expert witnesses. The names and addresses of these witnesses is contained in a report attached hereto marked Exhibit A and made a part hereof. The Curriculum Vitae of each of said witness is attached hereto marked Exhibit B1, B2 and B3 respectfully. A representative client list of disclosed witnesses is attached as Exhibit C.

-2-

The basis of the opinions of the expert witnesses is fully stated in the report attached as Exhibit A and represents the Plaintiffs' entire substantive communication from the witnesses.

-3-

Plaintiffs' have retained the firm of AI Environmental Consulting Services, 1401 Devon Road, Winter Park, Florida 32789, specifically Louis Llorens, Bruno A. Ferraro, and Douglas Bauman, each Curriculum Vitae is attached. These individuals have conducted an analysis of the following: (1) propane gas purchases made by Defendant Tri-State Crematory and/or the Marsh Defendants from Blossman Gas, P. O. Box 216, Highway 27 North, Lafayette, Georgia 30728; (2) the technical/mechanical/chemical capabilities of the Tri-State

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Crematory retort, Econo-Pac Mode #43, located at Tri State Crematory and manufactured by IEE (now known as Matthews Cremation Group, P. O. Box 547796, Orlando, Florida ); and (3) the number of bodies sent to Tri State Crematory as evidenced by calculations made jointly by Funeral Home Directors and Plaintiffs.

Messrs. Llorens, Ferraro, and Bauman have made accurate but not final determinations based on gas purchases and the ability/inability to properly cremate bodies based on actual gas purchases using a retort with a known consumption capacity, and known BTU to properly cremate a body together with numbers of bodies currently known. Plaintiffs expect the opinions of these experts to become more favorable to Plaintiffs as additional Defendant controlled information is available (bodies sent and gas purchase records for missing years). The analysis is currently accurate with current body counts and the methodology is accurate, and applicable to changing body counts by simple mathematic calculation.



Based upon the studies performed and outlined in the report, Plaintiffs expect these witness to opine that the Defendants purchased insufficient quantities of gas to properly cremate the numbers of bodies delivered to Tri-State Crematory during the time periods identified in the report.

Plaintiffs provided the above information to the Defendant on September 5, 2003 and herein provide Defendants with the report and Affidavit of Mr. Llorens, pursuant to file Rule 26(a)(b) to complete the record.

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**CERTIFICATE OF SERVICE**

| Pleadings Served: | I hereby certify that I have this 30 |
|---|---|
| 1. Plaintiff' Rule 26(a)(b) Expert Disclosure of AI Environmental Consulting Services | day of September, 2003, served those listed below by postage prepaid United States ail. |
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United States District Court ★ Northern District of Georgia ★

# EXHIBIT / ATTACHMENT

A

(To be scanned in place of tab)

# Tri-State Crematory
# Fuel Consumption Analysis

**Prepared for:**

**Coppedge & Leman, P.C.**
**508 South Thornton Avenue**
**Dalton, Georgia 30720**

**SEPTEMBER, 2003**

**Prepared by:**

&

GROVE
SCIENTIFIC & ENGINEERING

Friday, September 05, 2003

Joseph T. Leman
Coppedge & Leman, P.C.
508 South Thornton Avenue
Dalton, GA 30720

**Re: Tri-State Crematory – Draft Report**

Dear Mr. Leman:

Enclosed is one copy of the above referenced report. The purpose of this report was to assess the available fuel purchase data and reported human remains delivered to Tri-Sate crematory in Rock Spring, Georgia and perform a comparison between actual fuel purchases and required fuel usage based on the available deceased data.

As the data provided are incomplete, updates of Tables 1 through 3 should be made to once the data are available. The preliminary data demonstrates that the fuel purchase data does not agree with the theoretical fuel calculations at three different firing rates. The results are summarized as follows:

| Year | Number of Bodies | Gas Purchased Gallons LPG | Required LPG 1 MMBtu/hr | Required LPG 1.2 MMBtu/hr | Required LPG 1.38 MMBtu/hr |
|---|---|---|---|---|---|
| 1990 | 71 | 542 | 1961.38 | 2353.65 | 2706.70 |
| 1991 | 88 | 511 | 2431.00 | 2917.20 | 3354.78 |
| 1992 | 83 | Not Available | 2292.88 | 2751.45 | 3164.17 |
| 1993 | 109 | Not Available | 3011.13 | 3613.35 | 4155.35 |
| 1994 | 113 | 1250 | 3121.63 | 3745.95 | 4307.84 |
| 1995 | 95 | 2300 | 2624.38 | 3149.25 | 3621.64 |
| 1996 | 65 | 775 | 1795.63 | 2154.75 | 2477.96 |
| 1997 | 85 | 400 | 2348.13 | 2817.75 | 3240.41 |
| 1998 | 63 | 1571 | 1740.38 | 2088.45 | 2401.72 |
| 1999 | 59 | 1435 | 1629.88 | 1955.85 | 2249.23 |
| 2000 | 83 | 1965 | 2292.88 | 2751.45 | 3164.17 |
| 2001 | 79 | 1955 | 2182.38 | 2618.85 | 3011.68 |
| 2002 | 14 | Not Available | 386.75 | 464.10 | 533.72 |

1401 Devon Road, Winter Park, Fl 32789 – Phone: (407) 923-3945, (407) 629-1561 FAX: (407) 644-0823
Al @ CEL.RR.COM

The above results provide a limited snapshot on the usage of the retort at Tri-State Crematory.

If you have any questions, regarding the "draft" report, please call me at (407) 629-1561.

Respectfully,
AI ENVIRONMENTAL CONSULTING SERVICES, INC.

Luis Llorens
President

Douglas Bauman, P.E.
Florida Registration No. 50807

GROVE SCIENTIFIC & ENGINEERING COMPANY

Bruno Ferraro, CEP, QEP
President

# Table of Contents

## List Of Tables



## List of Attachments

# Section 1.0

## Introduction

### 1.1 Purpose

The purpose of this report was to assess the available fuel purchase data and reported human remains delivered to Tri-Sate crematory in Rock Spring, Georgia. To run a correlation analysis between fuel purchases, the number of human remains delivered to the facility and the calculated fuel required to cremate the reported number of human bodies.

### 1.2 Limitations

This document was prepared for the sole use of Coppedge & Leman, P.C., and their affiliates. Our professional judgment to assess the retort fuel usage is based on the data provided by Coppedge & Leman. No warranty is given or implied by this report as the raw data used in this report was provided to us and not collected by AI Environmental Consulting or it associates. Additionally, for this scope of work, no site visit was performed, only the review of the videotape provided by the client, Coppedge & Leman, P.C.

# Section 2.0

**Available Data**

## 2.1 Gas Data

Coppedge and Leman, P.C. provided the fuel usage data for the years 1990 through 2001. No data were available for the years 1992 and 1993 or years prior to 1990. Presently, Coppedge and Leman, P.C. is attempting to acquire the missing fuel usage and body count data. In Attachment 1 we have included copies of the gas usage data provided.

## 2.2 Data on Deceased Count

Coppedge and Leman, P.C. provided the data for the total bodies delivered to Tri-State Crematory. These data were separated by state and included data from Georgia, Tennessee, Alabama and Florida. It is our understanding that data from Tennessee, Alabama and Florida are not complete. However, the data from Georgia was considered complete. When the data from these States are made available, the report will be updated. In Attachment 2 we have included the summary table of the deceased.

## 2.3 Equipment Data

Coppedge and Leman, P.C. provided the data for the retort and the archive files from Grove Scientific & Engineering Company (GSE). All of the data provided by GSE and used in this analysis were submitted at one time or another to the Florida Department of Environmental Protection (FDEP) for permitting or compliance purposes. Once the data are submitted to the Department, they are considered public record under the State of Florida Sunshine Law.

The data were acquired from equipment that was similar to the retort at Tri-State Crematory. Specifically, equipment constructed during the 1980's, with the same model number, IE-43 and, the same type of application (human cremation) and fuel (propane, LPG, natural gas).

The data collected were fuel usage and burner capacity from air pollution annual operation reports and applications for air pollution permits. We have included these data collected from other sources in Attachment 3.

## 2.4 Video Review

In reviewing of the video, the front panel of the retort is open. We observed two burner controllers only. These burner controllers were without their covers. Based on the year the crematory was constructed, the burner controllers are most likely Honeywell or equivalent. The North American Manufacturing Company typically constructed the burners. Mr. Chuck Crawford, a consultant, stated in the video that the diagram of the crematory states that the IE-43 had a total burner capacity of 1.6 MMBTU/hr, but we have not verified this. This is a reasonable maximum firing rate for the year, make and model crematory. Actual firing rate is likely to be lower due to the year the retort was constructed.

# Section 3.0

# Analysis

## 3.1 Equipment Description

The Industrial Equipment and Engineering Company, Inc. Model IE-43 is a multi-chamber cremation unit with a rated capacity of approximately 100 pounds per hour with a two-hour cremation cycle time, which may vary depending on body weight and conditions. The primary chamber has one burner with an estimated capacity of 0.6 MMBTU per hour. The secondary chamber has one burner, usually rated from 0.8 MMBTU to 1 MMBTU per hour. The interior of the retort is made of a combination of refractory brick and castable refractory that can withstand temperatures of up to 3000°F. Combustion gases are vented to the atmosphere via a stack located in the back of the unit.

## 3.2 Process Description

The body is loaded into the primary chamber via loading table. The door of the retort is closed and latched. The equipment is started by turning three dials; one for the primary burner, one for the secondary burner and the master timer. The toggle switch for the each burner must be in the on position. The remains are typically cremated in a cardboard container or, in some cases, a cremation casket. Ignition of the remains releases a variety of hydrocarbons, particulates and other combustion products in the form of gases and smoke that pass from the primary chamber into the secondary combustion chamber. As the products of combustion pass through the throat, additional combustion air is provided through the throat airline. The secondary burner is located just after this passage so as to maximize (approximately 1400°F to 1850°F) ignition temperatures (dependent on State environmental requirements). The combustion products pass into the secondary combustion chamber where near-complete combustion of organics to carbon dioxide and water vapor takes place. The secondary combustion chamber is sized to obtain a retention time necessary for near-complete combustion of the smoke and odor caused by the cremation process, after which time the hot gases pass out the stack to the atmosphere.

The more the crematory is used the higher the efficiency of the equipment, in other words, if only one body is cremated at a given day, the fuel consumed per cremation is higher. If multiple cremations are performed, the fuel usage is reduced as the refractory retains heat.

The equipment at Tri-State crematory, at its best year, averages 2.2 cremations per week (1994). This usage-rate is considered low and will result in minimal heat retention in the refractory.

## 3.3 Approach to our Calculations

Based on the fact that the Tri-Sate Crematory was constructed in 1982, we believe that the crematory was probably set to burn from 1 MMBTU to 1.4 MMBTU per hour (total burner capacity).

We consulted with a crematory-manufacturing expert, Mr. James P. Crawford, who has constructed similar units for over 30 years, and used to work for Industrial Equipment back in the 70's. According to Mr. Crawford, the total burner firing rates are reasonable for the age of the equipment. When these earlier model 43 units were constructed, the burners were set to fire at a fixed rate, were not modulated and had no thermo-couples measuring chamber temperature. Based on other IE43 crematories permitted in the State of Florida, the firing rates are within the range stated above for a crematory in the 80's. Mr. Crawford stated that the crematory is an IE43-Power-Pack and not an Econo-Pack as stated in the sales receipt. In the photograph of the equipment, the control panel also stated Power Pack.

Also, based on the Rhames Lashea Marsh deposition of December 4, 2002, it seems that the Tri-State operated the retort without bypassing the secondary burner. In line 10 of the deposition she states that " I just know that you turn the knobs and then you would flip the switches up". Implying that both burners were used during cremation.

## 3.4 Data from Similar Equipment

According to the EPA's ICCR database on incinerators, Curlew Hills Memory Gardens had an IE-43 crematory originally constructed in 1982. The permit for this facility states; "The incinerator consists of primary and secondary (afterburner) chambers each fired on propane gas with a maximum total heat input rate of 1.2 MMBTU/hr".

The second crematory that data were acquired from was an IE-43 crematory installed at Scobee Ireland Potter Funeral Home during the 1980's. The air pollution permit for this crematory reported a firing rate of 0.6 MMBTU in the primary chamber and 0.8 MMBTU in the secondary chamber for a total firing rate of 1.3 MMBTU per hour. A later revision of the permit indicated a total firing rate of 1.5 MMBTU per hour when regulatory rules required an increase in secondary chamber temperature.

We also acquired fuel-usage data from Aycock Funeral Home. This funeral home owned an IE-43 (from the 80's) and reported 849 cremations with 23,000 gallons of LPG in their annual operating report submitted to the State of Florida. In a subsequent year, the facility reported 861 cremations with 23,678 gallons of LPG. At this hi-usage, the average fuel usage is 27 gallons per case. This average figure is considered on the low side of fuel usage since they were able to take advantage of thermal storage by the refractory.

In a compliance test report on an IE-43 Power-Oak II, performed by Industrial Equipment on March 24, 1992, the average fuel consumption rate was measured at 1.38 MMBTU/hr. This was a later model crematory with a higher firing-rate that the unit at Tri-State Crematory. As a conservative approach we shall consider this usage rate as our high fuel usage rate for an IE-43. See Attachment 3 for the data referenced in this section (Section 3.2).

## 3.5 Sample Calculation

For our sample calculation, we have selected data from the year 1990. In this year, the facility records indicate that 71 remains were delivered to Tri-State Crematory. According to Blossman Gas, Inc., 542 gallons of propane were sold to Tri-Sate. Therefore, if the crematory was set to a firing rate of 1.0 MMBTU/hr and a total of 2.5 hours between pre-heat and actual cremation are required, the projected fuel usage is as follows:

- (1.0 MMBTU/hr)(11.05 gallon LPG/1 MMBTU) = 11.05 Gallons LPG/hr
- (11.05 Gallons LPG/hr)(2.5 hours/cremation) = 27.63 gallons/cremation
- (27.63 gallons/cremation)(71 cremations/year) = 1962 gallons LPG/yr

Blossman Gas reported 542 gallons of LPG were purchased during the year of this analysis.

Based on our analysis, we have calculated the fuel usage at a low rate of 1.0 MMBTU/hr, a medium rate of 1.2 MMBTU/hr and a high rate of 1.38 MMBTU/hr. Our results are summarized in Tables 1 through 3.

# Table 1

## MMBTU/hr Firing Rate

| Year | Number of Bodies Reported | Burner(s) Firing Rate MMBtu/hr | Gallons LPG Per Hour | Hours to Cremate | Required Fuel Usage per Year Gallons LPG | Reported Fuel Usage allons LPG |
|---|---|---|---|---|---|---|
| 1980 | 1 | 1 | 11.05 | 2.5 | 27.63 | |
| 1981 | 1 | 1 | 11.05 | 2.5 | 27.63 | |
| 1982 | 11 | 1 | 11.05 | 2.5 | 303.88 | |
| 1983 | 26 | 1 | 11.05 | 2.5 | 718.25 | |
| 1984 | 37 | 1 | 11.05 | 2.5 | 1022.13 | |
| 1985 | 42 | 1 | 11.05 | 2.5 | 1160.25 | |
| 1986 | 34 | 1 | 11.05 | 2.5 | 939.25 | |
| 1987 | 48 | 1 | 11.05 | 2.5 | 1326.00 | |
| 1988 | 52 | 1 | 11.05 | 2.5 | 1436.50 | |
| 1989 | 60 | 1 | 11.05 | 2.5 | 1657.50 | |
| 1990 | 71 | 1 | 11.05 | 2.5 | 1961.38 | 542 |
| 1991 | 88 | 1 | 11.05 | 2.5 | 2431.00 | 511 |
| 1992 | 83 | 1 | 11.05 | 2.5 | 2292.88 | |
| 1993 | 109 | 1 | 11.05 | 2.5 | 3011.13 | |
| 1994 | 113 | 1 | 11.05 | 2.5 | 3121.63 | 1250 |
| 1995 | 95 | 1 | 11.05 | 2.5 | 2624.38 | 2300 |
| 1996 | 65 | 1 | 11.05 | 2.5 | 1795.63 | 775 |
| 1997 | 85 | 1 | 11.05 | 2.5 | 2348.13 | 400 |
| 1998 | 63 | 1 | 11.05 | 2.5 | 1740.38 | 1571 |
| 1999 | 59 | 1 | 11.05 | 2.5 | 1629.88 | 1435 |
| 2000 | 83 | 1 | 11.05 | 2.5 | 2292.88 | 1965 |
| 2001 | 79 | 1 | 11.05 | 2.5 | 2182.38 | 1955 |
| 2002 | 14 | 1 | 11.05 | 2.5 | 386.75 | |

# Table 2

## MMBTU/hr Firing Rate

| Year | Number of Bodies Reported | Burner(s) Firing Rate MMBtu/hr | Gallons LPG Per Hour | Hours to Cremate | Required Fuel Usage per Year Gallons LPG | Reported Fuel Usage allons LPG |
|---|---|---|---|---|---|---|
| 1980 | 1 | 1.2 | 13.26 | 2.5 | 33.15 | |
| 1981 | 1 | 1.2 | 13.26 | 2.5 | 33.15 | |
| 1982 | 11 | 1.2 | 13.26 | 2.5 | 364.65 | |
| 1983 | 26 | 1.2 | 13.26 | 2.5 | 861.90 | |
| 1984 | 37 | 1.2 | 13.26 | 2.5 | 1226.55 | |
| 1985 | 42 | 1.2 | 13.26 | 2.5 | 1392.30 | |
| 1986 | 34 | 1.2 | 13.26 | 2.5 | 1127.10 | |
| 1987 | 48 | 1.2 | 13.26 | 2.5 | 1591.20 | |
| 1988 | 52 | 1.2 | 13.26 | 2.5 | 1723.80 | |
| 1989 | 60 | 1.2 | 13.26 | 2.5 | 1989.00 | |
| 1990 | 71 | 1.2 | 13.26 | 2.5 | 2353.65 | 542 |
| 1991 | 88 | 1.2 | 13.26 | 2.5 | 2917.20 | 511 |
| 1992 | 83 | 1.2 | 13.26 | 2.5 | 2751.45 | |
| 1993 | 109 | 1.2 | 13.26 | 2.5 | 3613.35 | |
| 1994 | 113 | 1.2 | 13.26 | 2.5 | 3745.95 | 1250 |
| 1995 | 95 | 1.2 | 13.26 | 2.5 | 3149.25 | 2300 |
| 1996 | 65 | 1.2 | 13.26 | 2.5 | 2154.75 | 775 |
| 1997 | 85 | 1.2 | 13.26 | 2.5 | 2817.75 | 400 |
| 1998 | 63 | 1.2 | 13.26 | 2.5 | 2088.45 | 1571 |
| 1999 | 59 | 1.2 | 13.26 | 2.5 | 1955.85 | 1435 |
| 2000 | 83 | 1.2 | 13.26 | 2.5 | 2751.45 | 1965 |
| 2001 | 79 | 1.2 | 13.26 | 2.5 | 2618.85 | 1955 |
| 2002 | 14 | 1.2 | 13.26 | 2.5 | 464.10 | |

## Table 3

## MMBTU/hr Firing Rate

| Year | Number of Bodies Reported | Burner(s) Firing Rate MMBtu/hr | Gallons LPG Per Hour | Hours to Cremate | Required Fuel Usage per Year Gallons LPG | Reported Fuel Usage Gallons LPG |
|---|---|---|---|---|---|---|
| 1980 | 1 | 1.38 | 15.249 | 2.5 | 38.12 | |
| 1981 | 1 | 1.38 | 15.249 | 2.5 | 38.12 | |
| 1982 | 11 | 1.38 | 15.249 | 2.5 | 419.35 | |
| 1983 | 26 | 1.38 | 15.249 | 2.5 | 991.19 | |
| 1984 | 37 | 1.38 | 15.249 | 2.5 | 1410.53 | |
| 1985 | 42 | 1.38 | 15.249 | 2.5 | 1601.15 | |
| 1986 | 34 | 1.38 | 15.249 | 2.5 | 1296.17 | |
| 1987 | 48 | 1.38 | 15.249 | 2.5 | 1829.88 | |
| 1988 | 52 | 1.38 | 15.249 | 2.5 | 1982.37 | |
| 1989 | 60 | 1.38 | 15.249 | 2.5 | 2287.35 | |
| 1990 | 71 | 1.38 | 15.249 | 2.5 | 2706.70 | 542 |
| 1991 | 88 | 1.38 | 15.249 | 2.5 | 3354.78 | 511 |
| 1992 | 83 | 1.38 | 15.249 | 2.5 | 3164.17 | |
| 1993 | 109 | 1.38 | 15.249 | 2.5 | 4155.35 | |
| 1994 | 113 | 1.38 | 15.249 | 2.5 | 4307.84 | 1250 |
| 1995 | 95 | 1.38 | 15.249 | 2.5 | 3621.64 | 2300 |
| 1996 | 65 | 1.38 | 15.249 | 2.5 | 2477.96 | 775 |
| 1997 | 85 | 1.38 | 15.249 | 2.5 | 3240.41 | 400 |
| 1998 | 63 | 1.38 | 15.249 | 2.5 | 2401.72 | 1571 |
| 1999 | 59 | 1.38 | 15.249 | 2.5 | 2249.23 | 1435 |
| 2000 | 83 | 1.38 | 15.249 | 2.5 | 3164.17 | 1965 |
| 2001 | 79 | 1.38 | 15.249 | 2.5 | 3011.68 | 1955 |
| 2002 | 14 | 1.38 | 15.249 | 2.5 | 533.72 | |

# Section 4.0

# Summary

## 4.1 Conclusion

The data collected reflects a discrepancy between gas purchases and remains delivered to Tri-State Crematory. Even with a low firing rate of 1 MMBTU and assuming the equipment was operated at its highest efficiency, 1990, 1991, 1994, 1996 and 1997 are years were fuel purchases and calculated fuel required indicate that are the years that the largest discrepancies are observed.

In Table 4 our results are summarized for the years 1990 through 2002 (most complete data) and are follows:

### Table 4

### Results Summary

| Year | Number of Bodies | Gas Purchased Gallons LPG | Required LPG 1 MMBtu/hr | Required LPG 1.2 MMBtu/hr | Required LPG 1.38 MMBtu/hr |
|---|---|---|---|---|---|
| 1990 | 71 | 542 | 1961.38 | 2353.65 | 2706.70 |
| 1991 | 88 | 511 | 2431.00 | 2917.20 | 3354.78 |
| 1992 | 83 | Not Available | 2292.88 | 2751.45 | 3164.17 |
| 1993 | 109 | Not Available | 3011.13 | 3613.35 | 4155.35 |
| 1994 | 113 | 1250 | 3121.63 | 3745.95 | 4307.84 |
| 1995 | 95 | 2300 | 2624.38 | 3149.25 | 3621.64 |
| 1996 | 65 | 775 | 1795.63 | 2154.75 | 2477.96 |
| 1997 | 85 | 400 | 2348.13 | 2817.75 | 3240.41 |
| 1998 | 63 | 1571 | 1740.38 | 2088.45 | 2401.72 |
| 1999 | 59 | 1435 | 1629.88 | 1955.85 | 2249.23 |
| 2000 | 83 | 1965 | 2292.88 | 2751.45 | 3164.17 |
| 2001 | 79 | 1955 | 2182.38 | 2618.85 | 3011.68 |
| 2002 | 14 | Not Available | 386.75 | 464.10 | 533.72 |

The deceased data from Tennessee, Alabama and Florida are not complete. The fuel data provided was not complete. When the data from these States are made available, and the fuel data from the years 1980 through 1989 are available, the report will be updated.

# Attachment 1

## Gas Usage data

# Tri-State Crematory Propane Consumption/Usage Analysis

Last updated: 8/4/03

| Year | Gallons Purchased | Factor | Max Number Of Bodies | GA Bodies | TN * Bodies | AL * Bodies | FL * Bodies | TOTAL BODIES | Possible/ Deliverd | % |
|---|---|---|---|---|---|---|---|---|---|---|
| 1990 | 542 | 42.01 | 13 | 46 | 25 | 0 | 0 | 71 | 13 // 71 | 18% |
| 1991 | 511 | 42.01 | 12 | 57 | 31 | 0 | 0 | 88 | 12 // 88 | 14% |
| 1994 | 1250 | 42.01 | 30 | 74 | 38 | 1 | 0 | 113 | 30 // 113 | 26% |
| 1995 | 2300 | 42.01 | 55 | 53 | 42 | 0 | 0 | 95 | 55 // 95 | 58% |
| 1996 | 775 | 42.01 | 18 | 30 | 35 | 0 | 0 | 65 | 18 // 65 | 28% |
| 1997 | 400 | 42.01 | 10 | 36 | 48 | 1 | 0 | 85 | 10 // 85 | 11% |
| 1998 | 1571 | 42.01 | 37 | 17 | 45 | 1 | 0 | 63 | 37 // 63 | 59% |
| 1999 | 1435 | 42.01 | 34 | 18 | 41 | 0 | 0 | 59 | 34 // 59 | 58% |
| 2000 | 1965 | 42.01 | 47 | 40 | 43 | 0 | 0 | 83 | 47 // 83 | 56% |
| 2001 | 1955 | 42.01 | 47 | 28 | 50 | 0 | 1 | 79 | 47 // 79 | 59% |
| **TOTAL** | **12704** | | **302** | **399** | **398** | **3** | **1** | **801** | **302 // 801** | **38%** |

*** Incomplete List**
**N/A: Information not available at this time**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1992 | N/A | 42.01 | N/A | 50 | 32 | 0 | 1 | 83 | N/A | N/A |
| 1993 | N/A | 42.01 | N/A | 67 | 42 | 0 | 0 | 109 | N/A | N/A |
| 2002 | N/A | 42.01 | N/A | 4 | 10 | 0 | 0 | 14 | N/A | N/A |
| **TOTAL** | | | | **121** | **84** | **0** | **1** | **206** | | |

# Attachment 2

## Deceased Summary Table

Death Certificate Summary

# GEORGIA

| County | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Floyd | 0 | 0 | 2 | 2 | 3 | 8 | 3 | 7 | 4 | 2 | 1 | 2 | 1 | 6 | 3 | 6 | 1 | 1 | 1 | 0 | 2 | 2 | 0 | 57 |
| Bartow | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 3 | 6 | 6 | 2 | 4 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 27 |
| Gordon | 0 | 0 | 1 | 4 | 2 | 0 | 0 | 2 | 3 | 1 | 1 | 3 | 6 | 3 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 31 |
| Fulton | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 7 | 5 | 4 | 1 | 0 | 1 | 0 | 1 | 0 | 24 |
| Cherokee | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 2 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| Gilmer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Pickens | 0 | 0 | 0 | 1 | 3 | 1 | 2 | 3 | 2 | 2 | 5 | 1 | 1 | 3 | 2 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 30 |
| Fannin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| Whitfield | 0 | 0 | 2 | 4 | 9 | 9 | 7 | 8 | 2 | 6 | 18 | 14 | 18 | 20 | 23 | 17 | 10 | 16 | 3 | 5 | 5 | 6 | 1 | 203 |
| Harison | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Polk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 2 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| Catoosa | 0 | 0 | 3 | 5 | 10 | 10 | 6 | 8 | 14 | 8 | 6 | 15 | 8 | 14 | 15 | 7 | 5 | 4 | 1 | 3 | 4 | 3 | 1 | 160 |
| Paulding | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Walker | 0 | 0 | 0 | 2 | 1 | 5 | 0 | 3 | 0 | 2 | 0 | 3 | 2 | 8 | 3 | 9 | 3 | 5 | 3 | 3 | 5 | 11 | 2 | 70 |
| Chattooga | 0 | 0 | 3 | 1 | 1 | 1 | 4 | 2 | 5 | 1 | 2 | 2 | 2 | 1 | 5 | 4 | 0 | 3 | 2 | 1 | 3 | 2 | 0 | 45 |
| Murray | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 2 | 2 | 4 | 1 | 5 | 6 | 1 | 3 | 6 | 4 | 3 | 18 | 2 | 0 | 62 |
| Dade | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 8 |
| Dekalb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| Warren | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Cobb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| TOTAL | 0 | 1 | 11 | 20 | 32 | 37 | 24 | 37 | 35 | 29 | 46 | 57 | 50 | 67 | 74 | 53 | 30 | 36 | 17 | 18 | 40 | 28 | 4 | 746 |

## TENNESSEE (Incomplete)

| County | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rutherford | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | **2** |
| Hamilton | 0 | 0 | 0 | 6 | 5 | 4 | 8 | 6 | 10 | 17 | 9 | 18 | 16 | 23 | 20 | 26 | 20 | 45 | 39 | 37 | 37 | 41 | 8 | **395** |
| Franklin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | **7** |
| Bradley | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 4 | 4 | 11 | 11 | 12 | 10 | 16 | 13 | 14 | 9 | 1 | 3 | 4 | 4 | 2 | 0 | **121** |
| Bledsoe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **6** |
| Sequatchie | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | **7** |
| Van Buren | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Cumberland | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Marion | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 0 | 0 | 4 | 1 | **22** |
| Davidson | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Etowah | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| **TOTAL** | **0** | **0** | **0** | **6** | **5** | **5** | **10** | **11** | **16** | **31** | **25** | **31** | **32** | **42** | **38** | **42** | **35** | **48** | **45** | **41** | **43** | **50** | **10** | **566** |

## ALABAMA (Incomplete)

| County | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jackson | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Marshall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Jenkins | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Mobile | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Richmond | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| TOTAL | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 5 |

## FLORIDA (Incomplete)

| County | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alachua | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| St. Lucie | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| TOAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |

## TOTAL BODIES

| 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 11 | 26 | 37 | 42 | 34 | 48 | 52 | 60 | 71 | 88 | 83 | 109 | 113 | 95 | 65 | 85 | 63 | 59 | 83 | 79 | 14 | 1319 |

Death Certificate Summary

# Curlew Hill Memory Gardens

FLORIDA

# Department of Environmental Protection

Lawton Chiles
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Virginia B. Wetherell
Secretary

**PERMITTEE:**
Curlew Hills Memory Gardens, Inc.
1750 Curlew Road
Palm Harbor, Florida 34683

**PERMIT/PROJECT:**
**Permit No:** AO52-233610A
**County:** Pinellas
**Original Issuance:** 02/10/93
**Amendment Issued:** 01/12/95
**Expiration Date:** 02/16/98
**Project:** Human Crematory

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-200 through 297, and Chapter 62-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans and other documents, attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the operation of a Industrial Equipment & Engineering Model IE43 Power Pak crematory incinerator. The unit is designed to incinerate human remains and associated container material at an average rate of 150 pounds per hour (the average rate is the total weight loaded into the unit divided by the duration of the burn). The incinerator consists of primary and secondary (afterburner) chambers each fired on propane gas with a maximum total heat input rate of 1.2 MMBtu/hr.

Emissions are controlled by the afterburner which maintains a minimum secondary chamber combustion zone temperature of 1,400°F prior to and during combustion of material in the primary chamber. The secondary (afterburner) chamber volume provides at least a one (1) second residence time at a gas temperature of 1,600°F. The unit is equipped with continuous temperature monitoring system to measure and record the secondary chamber operating temperature.

**Location:** 1750 Curlew Road, Palm Harbor

**UTM:** 17-360.0 E 3105.4 N **NEDS No:** 0096 **Point ID No:** 01
**APIS ID:** 40-PNL-52-0096-01

**Replaces Permit No.:** AO52-142294 and previously (February 10, 1993) issued version of AO52-233610

# Attachment 3

## Similar Equipment Data

Death Certificate Summary

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Los Angeles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| Calhoun | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

**Table 8: Facilities With No SIC Data**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| INCINERATO | FL | 121030098 | CURLEW HILLS MEMORY GARDENS | 0-100 | PALM HARBOR | Industrial Equipment & Engineering | POWER PAK IE-43 | 000000001 | 82 | HR |
| INCINERATO | FL | 12106W177 | HEATH FUNERAL CHAPEL | 0-100 | | Crawford Equipment & Engineering | AC 53-224756 | Q001 | 91 | |
| INCINERATO | FL | 121110042 | ST LUCIE COUNTY INTL AIRPORT | 0-100 | | Simonds Mfg. Corp. | 751B | Q001 | 88 | LP |
| INCINERATO | FL | 121110042 | ST LUCIE COUNTY INTL AIRPORT | 0-100 | | Simonds Mfg. Corp. | 751B | Q001 | 88 | M3 |
| INCINERATO | FL | 121110042 | ST LUCIE COUNTY INTL AIRPORT | 0-100 | | Simonds Mfg. Corp. | 751B | Q001 | 88 | MO |
| INCINERATO | FL | 121110042 | ST LUCIE COUNTY INTL AIRPORT | 0-100 | | Simonds Mfg. Corp. | 751B | Q001 | 88 | OS |
| INCINERATO | FL | 121110050 | HAISLEY-HOBBS FUNERAL HOME | 0-100 | FT. PIERCE | | | Q001 | | NG |
| INCINERATO | FL | 12121W123 | FL DEPT OF AGRICULTURE - LIVE OAK DIV. | 0-100 | | Morse Boulger Corp. | 228 39 B | Q01 | 65 | AR |
| INCINERATO | FL | 12121W123 | FL DEPT OF AGRICULTURE - LIVE OAK DIV. | 0-100 | | Morse Boulger Corp. | 228 39 B | Q01 | 65 | MW |
| INCINERATO | FL | 12121W123 | FL DEPT OF AGRICULTURE - LIVE OAK DIV. | 0-100 | | Morse Boulger Corp. | 228 39 B | Q01 | 65 | NG |
| INCINERATO | GA | 13279W350 | BETHANY HOME NURSING | 100-250 | Vidalia | National Incinerator, Inc. | P50 | Q001 | 93 | NG |
| INCINERATO | GA | 13279W350 | BETHANY HOME NURSING | 100-250 | Vidalia | National Incinerator, Inc. | P50 | Q001 | 93 | OS |
| INCINERATO | ID | 160010038 | MOUNTAIN VIEW FUNDERAL HOME & | 0-100 | BOISE | Industrial Equipment & Engineering | POWER-PAK II 1E-43 | Q01 | 95 | HR |
| INCINERATO | ID | 160010039 | CLOVERDALE FUNERAL HOME | 0-100 | BOISE | Industrial Equipment & Engineering | ECON-O-PAK IE40 | | 75 | HR |
| INCINERATO | ID | 160010039 | CLOVERDALE FUNERAL HOME | 0-100 | BOISE | Industrial Equipment & Engineering | ECON-O-PAK IE40 | | 75 | NG |
| INCINERATO | ID | 160010100 | MOUNTAIN VIEW ANIMAL CLINIC | 0-100 | MERIDIAN | Crawford Equipment & Engineering | C-500P | C 500 P | 85 | AR |
| INCINERATO | ID | 160010100 | MOUNTAIN VIEW ANIMAL CLINIC | 0-100 | MERIDIAN | Crawford Equipment & Engineering | C-1000H | C 1000 H | 93 | AR |
| INCINERATO | ID | 160050022 | ALPINE ANIMAL HOSPITAL | 0-100 | POCATELLO | | | Q001 | | NG |
| INCINERATO | ID | 160110018 | GROVE CITY CREMATORY | 0-100 | BLACKFOOT | Crawford Equipment & Engineering | C-1000 | Q001 | 84 | HR |
| INCINERATO | ID | 160110018 | GROVE CITY CREMATORY | 0-100 | BLACKFOOT | Crawford Equipment & Engineering | C-1000 | Q001 | 84 | NG |
| INCINERATO | ID | 160110021 | HILL-SANDBERG FUNERAL HOME | 0-100 | BLACKFOOT | CRANFORD | D1280 | Q01 | 89 | |
| INCINERATO | ID | 160550026 | CD'A MEMORIAL GARDEN | 0-100 | COEUR D'ALENE | Industrial Equipment & Engineering | ECONOPAK | Q01 | 78 | |
| INCINERATO | ID | 160550027 | YATES FUNERAL HOME | 0-100 | COEUR D'ALENE | All Crematory Corp. | 1701 | 752506 | 78 | HR |
| INCINERATO | ID | 160550028 | ENGLISH FUNERAL CHAP | 0-100 | COEUR D'ALENE | Crawford Equipment & Engineering | C-1000 | Q001 | 85 | |
| INCINERATO | ID | 160690016 | SOUTHWAY ANIMAL CLINIC | 0-100 | LEWISTON | Shenandoah Mfg. | P4-2G | Q001 | 87 | |
| INCINERATO | IL | 170190130 | CROSSROADS VETERINARY CLINIC & HOSPITAL | 0-100 | URBANA | Shenandoah Mfg. | P9-2GN | Q001 | 88 | AR |
| INCINERATO | IL | 170190130 | CROSSROADS VETERINARY CLINIC & HOSPITAL | 0-100 | URBANA | Shenandoah Mfg. | P9-2GN | Q001 | 88 | NG |
| INCINERATO | IL | 17025E123 | BUEHLER FOODS, INC. | 0-100 | FLORA | National Incinerator, Inc. | C750 | | 93 | MI |
| INCINERATO | IL | 17025E123 | BUEHLER FOODS, INC. | 0-100 | FLORA | National Incinerator, Inc. | C750 | | 93 | MO |
| INCINERATO | IL | 170290056 | SARAH BUSH LINCOLN HEALTH CENTER | 751-1,000 | MATTOON | Kelley Co., Inc. | I-003800-D-C-00 | Q001 | 79 | D2 |
| INCINERATO | IL | 170290056 | SARAH BUSH LINCOLN HEALTH CENTER | 751-1,000 | MATTOON | Kelley Co., Inc. | I-003800-D-C-00 | Q001 | 79 | M3 |
| INCINERATO | IL | 170290056 | SARAH BUSH LINCOLN HEALTH CENTER | 751-1,000 | MATTOON | Kelley Co., Inc. | I-003800-D-C-00 | Q001 | 79 | NG |
| INCINERATO | IL | 17029E128 | PEG ANNA BLUE | 0-100 | MATTOON | Shenandoah Mfg. | P4-2G | Q001 | 96 | AR |
| INCINERATO | IL | 170310092 | STAR MOULDING & TRIM CO. | 0-100 | BEDFORD PARK | G & S Mill, Inc. | K72 | Q001 | 88 | WL |
| INCINERATO | IL | 170310415 | WOODLAWN CEMETERY OF CHICAGO, INC. | 0-100 | FOREST PARK | Industrial Equipment & Engineering | | Q001 | 93 | HR |
| INCINERATO | IL | 170310710 | CATHOLIC BISHOP OF CHICAGO, THE | 0-100 | NILES | Joseph Goder, Inc. | 400 IN | 326167860 | 50 | M2 |
| INCINERATO | IL | 170310710 | CATHOLIC BISHOP OF CHICAGO, THE | 0-100 | NILES | Joseph Goder, Inc. | 400 IN | 326167860 | 50 | NG |
| INCINERATO | IL | 170310857 | CREMATION SERVICES INC. | 0-100 | ROSEMONT | Basic Engineering Inc. | | | 85 | |
| INCINERATO | IL | 170311060 | REGINA DOMINICAN HIGH SCHOOL | 0-100 | WILMETTE | Joseph Goder, Inc. | 903-IN | Q001 | 86 | MO |
| INCINERATO | IL | 170311415 | MAJOR ARMATURE CO. | 0-100 | CHICAGO | Bayco Ovens | BB-150 | D31600BSR | 82 | |
| INCINERATO | IL | 170311731 | PREVUE PET PRODUCTS INC. | 100-250 | CHICAGO | National Incinerator, Inc. | | Q001 | | |
| INCINERATO | IL | 170311732 | PREVUE PET PRODUCTS, INC. | 0-100 | CHICAGO | National Incinerator, Inc. | 1010 | Q002 | | |
| INCINERATO | IL | 170311842 | UNIV. OF ILL. CHICAGO - BIO. RES. LAB | 0-100 | CHICAGO | Crawford Equipment & Engineering | C-1000S | Q01 | 96 | |

Scobee Ireland Potter Funeral Home

Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

: Height: ____________ ft. Stack Diameter: ____________ ft.

Flow Rate: ________ ACFM ________ DSCFM Gas Exit Temperature: ____________ °F.

.: Vapor Content: ____________ % Velocity: ____________ FPS

SECTION IV: INCINERATOR INFORMATION

| ·pe of ·aste | Type 0 (Plastics) | Type I (Rubbish) | Type II (Refuse) | Type III (Garbage) | Type IV (Patholog-ical) | Type V (Liq.& Gas By-prod.) | Type VI (Solid By-prod.) |
|---|---|---|---|---|---|---|---|
| ·ual hr ·ner-·ed | | | | | 150 | | |
| on-·lled ·/hr) | | | | | 0.6 | | |

·iption of Waste Human remains and cardboard box

Weight Incinerated (lbs/hr) 150 Design Capacity (lbs/hr) 150

·ximate Number of Hours of Operation per day 8 day/wk 7 wks/yr. 52

·acturer Industrial Equipment and Engineering, Inc.

Constructed 1967 Model No. IE-42

| | Volume $(ft)^3$ | Heat Release (BTU/hr) | Fuel | | Temperature (°F) |
|---|---|---|---|---|---|
| | | | Type | BTU/hr | |
| ·ry Chamber | 63 | 750,000 | Nat. gas | 600,000 | 1000 Average |
| ·ndary Chamber | 65 | 900,000 | Nat. gas | 900,000 | 1600 Average |

Height: 20 ft. Stack Diamter: 1.67 Stack Temp. 900° F.

·low Rate: 2000 ACFM 725 DSCFM* Velocity: 15 FPS

·] or more tons per day design capacity, submit the emissions rate in grains per stan-·cubic foot dry gas corrected to 50% excess air.

·of pollution control device: [ ] Cyclone [ ] Wet Scrubber [X] Afterburner

[ ] Other (specify) ____________

# EMISSIONS TESTING
of the
# INDUSTRIAL EQUIPMENT & ENGINEERING CO.
Crematory Incinerator

## POWER-PAK II - IE43-PPII

SES Reference No. 92S22

Project Participants

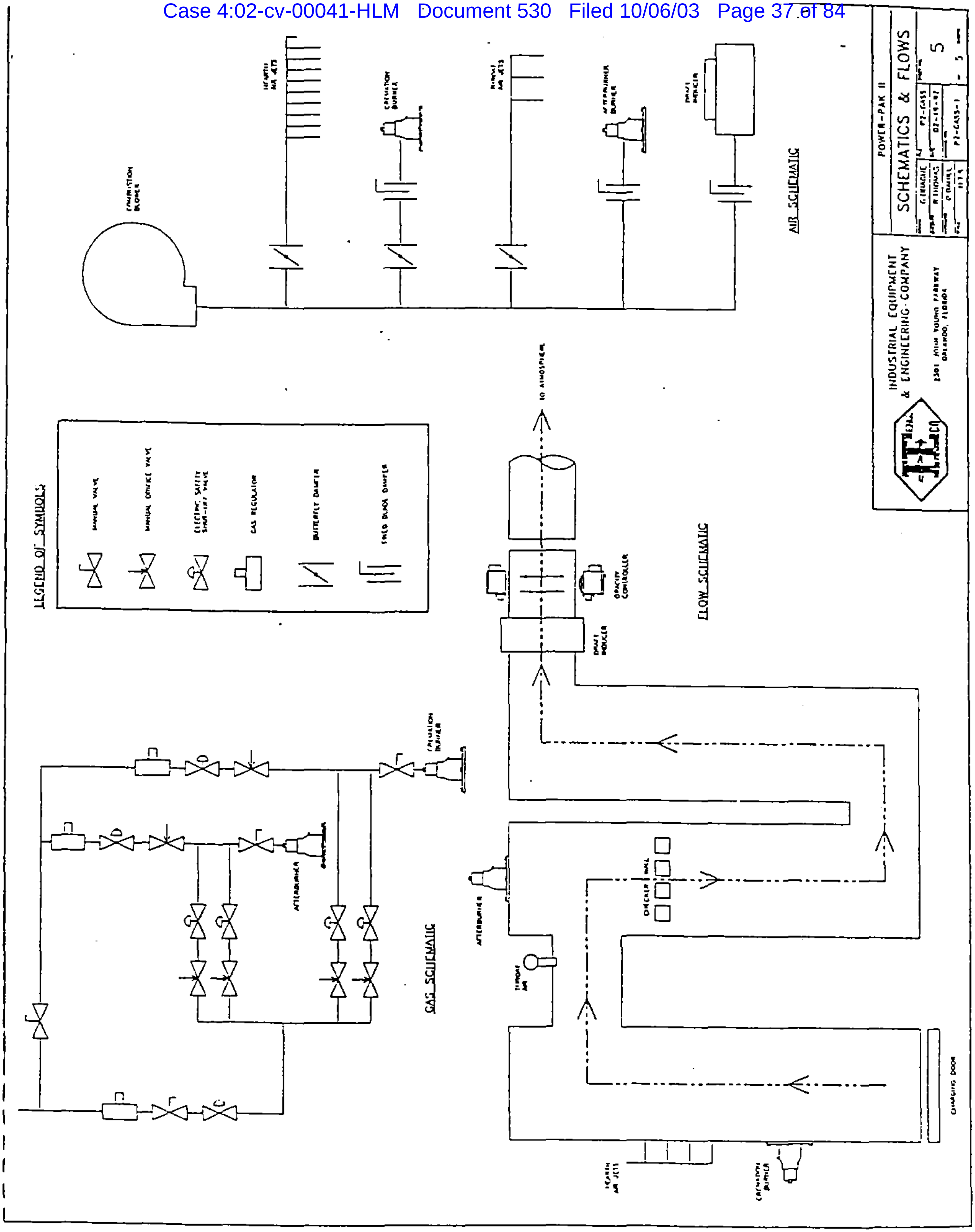
Byron E. Nelson
Kenneth M. Roberts
Charles R. Wilson
William T. Bunch

# TABLE 1. EMISSIONS TEST SUMMARY

Company: INDUSTRIAL EQUIPMENT & ENGINEERING CO., INC.
Source: Power-Pak II Crematory - Model IE43-PPII

| | Run 1 | Run 2 | Run 3 |
|---|---|---|---|
| Date of Run | 3/24/92 | 3/24/92 | 3/24/92 |
| Process Rate (lb./hr.) | 215 | 166 | 142 |
| Start Time (24-hr. clock) | 1010 | 1257 | 1529 |
| End Time (24-hr. clock) | 1113 | 1359 | 1631 |
| Vol. Dry Gas Sampled Meter Cond. (DCF) | 32.337 | 43.827 | 43.274 |
| Gas Meter Calibration Factor | 0.979 | 0.979 | 0.979 |
| Barometric Pressure at Barom. (in. Hg.) | 30.11 | 30.13 | 30.07 |
| Elev. Diff. Manom. to Barom. (ft.) | 0 | 0 | 0 |
| Vol. Gas Sampled Std. Cond. (DSCF) | 31.438 | 42.320 | 41.761 |
| Vol. Liquid Collected Std. Cond. (SCF) | 4.536 | 6.554 | 5.385 |
| Moisture in Stack Gas (% Vol.) | 12.6 | 13.4 | 11.4 |
| Molecular Weight Dry Stack Gas | 29.61 | 29.59 | 29.60 |
| Molecular Weight Wet Stack Gas | 28.15 | 28.04 | 28.28 |
| Stack Gas Static Press. (in. H2O gauge) | -0.03 | -0.03 | -0.03 |
| Stack Gas Static Press. (in. Hg. abs.) | 30.11 | 30.13 | 30.07 |
| Average Square Root Velocity Head | 0.198 | 0.201 | 0.199 |
| Average Orifice Differential (in. H2O) | 1.016 | 1.942 | 1.903 |
| Average Gas Meter Temperature (°F) | 76.4 | 81.6 | 80.8 |
| Average Stack Gas Temperature (°F) | 926.8 | 1181.0 | 1188.1 |
| Pitot Tube Coefficient | 0.84 | 0.84 | 0.84 |
| Stack Gas Vel. Stack Cond. (ft./sec.) | 18.17 | 20.13 | 19.86 |
| Effective Stack Area (sq. ft.) | 2.18 | 2.18 | 2.18 |
| Stack Gas Flow Rate Std. Cond. (DSCFM) | 796 | 739 | 741 |
| Stack Gas Flow Rate Stack Cond. (ACFM) | 2,379 | 2,635 | 2,599 |
| Net Time of Run (min.) | 60 | 60 | 60 |
| Nozzle Diameter (in.) | 0.500 | 0.620 | 0.620 |
| Percent Isokinetic | 105.3 | 99.4 | 97.8 |
| Propane Gas Usage (MMBTU/hr.) | 1.38 | 1.26 | 1.44 |
| Particulate Collected (mg.) | 38.6 | 24.0 | 28.6 |
| Particulate Emissions (lb./hr.) | 0.13 | 0.06 | 0.07 |
| Particulate Emissions (gr./DSCF) | 0.019 | 0.009 | 0.011 |
| Particulate Emissions (gr./DSCF @ 7% $O_2$) | 0.026 | 0.012 | 0.015 |
| Avg. Particulate Emissions (gr./DSCF @ 7% $O_2$) | | 0.018 | |
| Allowable Part. Emissions (gr./DSCF @ 7% $O_2$) | | 0.100 | |
| CO Emissions (ppm) | 2.8 | 0.5 | 0.7 |
| CO Emissions (ppm @ 7% $O_2$) | 3.8 | 0.7 | 1.0 |
| Avg. CO Emissions (ppm @ 7% $O_2$) | | 1.8 | |
| Allowable CO Emissions (ppm @ 7% $O_2$) | | 100 | |

Note: Standard conditions 68°F, 29.92 in. Hg


AIR SCHEMATIC
FLOW SCHEMATIC
GAS SCHEMATIC
LEGEND OF SYMBOLS
MANUAL VALVE
MANUAL ORIFICE VALVE
GAS REGULATOR
BUTTERFLY DAMPER
FIXED BLADE DAMPER
TO ATMOSPHERE
OPACITY CONTROLLER
CHARGING DOOR
POWER-PAK II
SCHEMATICS & FLOWS
INDUSTRIAL EQUIPMENT & ENGINEERING COMPANY
2301 JOHN YOUNG PARKWAY
ORLANDO, FLORIDA
5

### 4.3 Sampling Trains

The particulate sampling train consisted of a Nutech Corporation 3' water-cooled probe, utilizing a heated stainless steel liner, heated glass fiber filter, and four impingers arranged as shown in Figure 3. Flexible tubing was used between the heated filter and the impingers. The first two impingers were each charged with 100 milliliters of water, the third served as a dry trap, and the fourth was charged with indicating silica gel desiccant. The impingers were cooled in an ice and water bath during sampling. A Nutech Corporation control console was used to monitor the gas flow rates and stack conditions during sampling.

The carbon monoxide sampling train consisted of a stainless steel probe, teflon sample line, condenser, silica gel and ascarite tubes, and a Thermo Environmental Instruments, Inc. Model 48 Gas Filter Correlation CO Analyzer.

The oxygen sampling train consisted of a probe, sample line, tedlar bag in a rigid container, valve, vacuum pump and flow meter.

### 4.4 Sample Collection

Prior to particulate sampling, the pitot tubes were checked for leaks and the manometers were zeroed. A pretest leak check of the particulate sampling train was conducted by sealing the nozzle and applying a 15" Hg. vacuum. A leak rate of less than 0.02 cubic feet per minute was considered acceptable. Particulate sample was collected isokinetically for two and one half minutes at each of the points sampled.

The carbon monoxide analyzer was calibrated immediately before the beginning and after the end of the test by introducing known gases into the instrument through the sampling train. Zero and a calibration gas were also introduced after each run.

The tedlar bag used for obtaining an integrated oxygen sample was leak checked prior to the test by pressurizing it to 2 to 4 in. $H_2O$ and allowing it to stand overnight. A deflated bag indicated a leak. A one hour integrated sample was obtained at a rate of 0.5 liters per minute for each run.

Carbon monoxide and oxygen sampling were conducted simultaneously with particulate sampling.

### 4.5 Sample Recovery

A post test leak check of the particulate sampling train was performed at the completion of each run by sealing the nozzle and applying a vacuum equal to or greater than the maximum value reached during the sample period. A leak rate of less than 0.02 CFM or 4% of the average sampling rate (whichever was less) was considered acceptable. The nozzle and probe were brushed and rinsed with reagent grade acetone and the washings were placed in clean polyethylene containers and sealed. The glass fiber filter was removed from the holder with forceps and placed in a covered petri dish for return to the laboratory. The front half of the filter holder was rinsed with acetone and the washings were added to the nozzle and probe wash. The contents of the first three impingers were measured volumetrically and the silica gel in the fourth impinger was weighed to the nearest 0.1 gram for determination of moisture content.

Two calculations of the moisture content of the stack gas were made for each run, one from the impinger analysis and one from the assumption of saturated conditions based upon the average stack gas temperature and a psychrometric chart as described in EPA Method 4 - Determination of Moisture Content in Stack Gases, 40 CFR 60, Appendix A. The lower of the two values of moisture content was considered to be correct.

# INDUSTRIAL EQUIPMENT & ENGINEERING CO.
## Crematory Incinerator
## Orlando, Florida

March 24, 1992

## PROJECT PARTICIPANTS AND CERTIFICATION

Project Participants:

| | |
|---|---|
| Byron E. Nelson<br>Charles R. Wilson<br>William T. Bunch | Conducted the field testing. |
| Byron E. Nelson | Performed visible emissions evaluation. |
| Paul Rahill (IEE) | Provided process rates. |
| Kenneth M. Roberts | Peformed laboratory analyses. |
| Kenneth M. Roberts | Prepared the final test report. |

Certification:

I certify that to my knowledge all data submitted in this report is true and correct.

Byron E. Nelson

PROCESS WEIGHT STATEMENT

DATE 3/24/92 SAMPLING TIME: FROM 10:00 A.M. TO 4:30 P.M.

STATEMENT OF PROCESS WEIGHT:

COMPANY NAME Industrial Equipment & Engineering Co.

MAILING ADDRESS P.O. Box 547795, Orlando, Florida 32854

SOURCE IDENTIFICATION Crematory Incinerator

SOURCE LOCATION 2501 John Young Pkwy., Orlando, Florida 32804

DATA ON OPERATING CYCLE TIME:

START OF OPERATION, TIME N/A

END OF OPERATION, TIME

ELAPSED TIME

IDLE TIME DURING CYCLE

DESIGN PROCESS RATING: PROCESS WEIGHT RATE (INPUT)
PRODUCT (OUTPUT)

DATA ON ACTUAL PROCESS RATE DURING OPERATION CYCLE:
(Include Specifications on Fossil Fuels)

MATERIAL Human remains and wooden box RATE* 215 lbs/hr.

MATERIAL Human remains and wooden box RATE* 166 lbs/hr.

MATERIAL Human remains and wooden box RATE* 142 lbs/hr.

TOTAL PROCESS WEIGHT RATE*

PRODUCT RATE

PRODUCT RATE

PRODUCT RATE

I certify that the above statement is true to the best of my knowledge and belief.

Signature [signature]

Title V. PRESIDENT

Southern _nvironmental Science_, Inc.

MOISTURE COLLECTED

Plant INDUSTRIAL Equipment + Eng., INC.

Unit CREMATORY
Date 3/24/92
Run No. ONE

| Impinger Number | 1 | 2 | 3 | 4 | Weighed by: |
|---|---|---|---|---|---|
| Final Weight (grams): | 188.0 | 102.0 | 0 | 272.4 | CRW |
| Initial Weight (grams): | 100.0 | 100.0 | 0 | 266.2 | CRW |
| Difference (grams): | 88.0 | 2.0 | 0 | 6.2 | |
| Total Condensate (grams): | | | | 96.2 | |

Unit CREMATORY
Date 3/24/92
Run No. TWO

| Impinger Number | 1 | 2 | 3 | 4 | Weighed by: |
|---|---|---|---|---|---|
| Final Weight (grams): | 224.0 | 106.0 | 0 | 278.0 | CRW |
| Initial Weight (grams): | 100.0 | 100.0 | 0 | 269.0 | CRW |
| Difference (grams): | 124.0 | 6.0 | 0 | 9.0 | |
| Total Condensate (grams): | | | | 139.0 | |

Unit CREMATORY
Date 3/24/92
Run No. THREE

| Impinger Number | 1 | 2 | 3 | 4 | Weighed by: |
|---|---|---|---|---|---|
| Final Weight (grams): | 204.0 | 102.0 | 0 | 274.2 | CRW |
| Initial Weight (grams): | 100.0 | 100.0 | 0 | 266.0 | CRW |
| Difference (grams): | 104.0 | 2.0 | 0 | 8.2 | |
| Total Condensate (grams): | | | | 114.2 | |

# Southern _nvironmental Science_, Inc.

## FIELD DATA SHEET

Company INDUSTRIAL EQUIPMENT + ENG., INC.
Source CREMATORY
perator(s) C. WILSON + T. BINCH

Run Number TWO
Date 3/24/92
24 hr Time at Start 1757
24 hr Time at End 1359
Filter No(s). ~~210~~ 2105
Impinger Set No. —
Barometric Press. ("Hg) 30.13
Ambient Temperature (°F) 78°F

Duct Dimensions: ☑ Dia. ☐ L x W 20"
Stack Static Press. ("$H_2O$) -.03
Meter Box No. 004
Meter ΔH@ 1.961
Meter Correction Factor 0.979
Pitot Cp .84
Nozzle ID #33
Nozzle Dia. (inches) .620
Probe Length/Liner 3Ft W/C STEEL

Assumptions:
% moisture 13
stack temp. 1200
meter temp. 85
1.055
K Factor 47.53

Sample Train Leak Check:
Initial 0.006 CFM @ 15 "Hg
Final 0.002 CFM @ 5 "Hg
Init. Pitot Tube (-) ✓ (+) ✓
Final Pitot Tube (-) ✓ (+) ✓

| Point No. | Sample Time, θ (min) | Meter Vol., $V_m$ ($ft^3/m^3$) | Velocity Head, ΔP ("$H_2O$) | Orifice Diff., ΔH ("$H_2O$) | Stack Temp., $T_s$ (°F) | Meter Temp., $T_m$ (°F) | Hot Box Temp. (°F) | Exit Temp. (°F) | Pump Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0 | 445.947 | .02 | .95 | 1139 | 76 | 252 | 65 | 2.0 |
| 2 | 2.5 | 447.34 | .04 | 1.90 | 1216 | 76 | 251 | 56 | 2.5 |
| 3 | 5.0 | 449.11 | .05 | 2.38 | 1224 | 77 | 252 | 54 | 2.5 |
| 4 | 7.5 | 451.12 | .04 | 1.90 | 1222 | 77 | 250 | 54 | 2.5 |
| 5 | 10.0 | 452.91 | .04 | 1.90 | 1222 | 77 | 252 | 56 | 2.5 |
| 6 | 12.5 | 454.74 | .04 | 1.90 | 1214 | 77 | 256 | 58 | 2.5 |
| 7 | 15.0 | 456.55 | .03 | 1.43 | 1138 | 79 | 260 | 60 | 2.5 |
| 8 | 17.5 | 458.21 | .04 | 1.90 | 1159 | 79 | 261 | 60 | 2.5 |
| 9 | 20.0 | 459.92 | .04 | 1.90 | 1141 | 80 | 260 | 60 | 3.0 |
| 10 | 22.5 | 461.73 | .04 | 1.90 | 1160 | 81 | 258 | 60 | 3.0 |
| 11 | 25.0 | 463.54 | .04 | 1.90 | 1130 | 82 | 257 | 60 | 3.0 |
| 12 | 27.5 | 465.35 | .04 | 1.90 | 1106 | 83 | 256 | 60 | 3.0 |
| 13 1 | 30.0 | 467.13 | .05 | 2.38 | 1222 | 83 | 252 | 65 | 3.5 |
| 14 2 | 32.5 | 469.28 | .05 | 2.38 | 1229 | 83 | 250 | 60 | 3.5 |
| 15 3 | 35.0 | 471.18 | .05 | 2.38 | 1235 | 83 | 250 | 60 | 3.5 |
| 16 4 | 37.5 | 473.21 | .05 | 2.38 | 1230 | 84 | 253 | 60 | 3.5 |
| 17 5 | 40.0 | 475.29 | .05 | 2.38 | 1216 | 84 | 258 | 62 | 3.5 |
| 18 6 | 42.5 | 477.41 | .05 | 2.38 | 1208 | 85 | 263 | 62 | 3.5 |
| 19 7 | 45.0 | 479.42 | .04 | 1.90 | 1199 | 85 | 261 | 62 | 3.0 |
| 20 8 | 47.5 | 481.14 | .04 | 1.90 | 1172 | 85 | 259 | 62 | 3.0 |
| 21 9 | 50.0 | 482.94 | .04 | 1.90 | 1160 | 85 | 256 | 62 | 3.0 |
| 22 10 | 52.5 | 484.74 | .03 | 1.43 | 1166 | 86 | 252 | 62 | 3.0 |
| 23 11 | 55.0 | 486.35 | .03 | 1.43 | 1123 | 86 | 248 | 62 | 3.0 |
| 24 12 | 57.5 | 487.97 | .04 | 1.90 | 1112 | 86 | 247 | 62 | 3.0 |
| | 60.0 | 489.774 | | | | | | | |

# GAS ANALYSIS DATA FORM

PLANT Ind. Eqpt. & Eng. Co. Crematory Incin.
DATE 3/24/92 TEST NO 1
SAMPLING TIME (24-hr CLOCK) 1010 - 1113 hrs
SAMPLING LOCATION Stack
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) Integrated bag
ANALYTICAL METHOD ORSAT
AMBIENT TEMPERATURE 74 °F
OPERATOR B. Nelson

COMMENTS:

| RUN / GAS | 1 | | 2 | | 3 | | AVERAGE NET VOLUME | MULTIPLIER | MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) $M_d$. |
|---|---|---|---|---|---|---|---|---|---|
| | ACTUAL READING | NET | ACTUAL READING | NET | ACTUAL READING | NET | | | |
| $CO_2$ | 7.4 | 7.4 | 7.4 | 7.4 | 7.4 | 7.4 | 7.4 % | 44/100 | 3.256 |
| $O_2$ (NET IS ACTUAL $O_2$ READING MINUS ACTUAL $CO_2$ READING) | 18.2 | 10.8 | 18.1 | 10.7 | 18.1 | 10.7 | 10.7 % | 32/100 | 3.424 |
| CO (NET IS ACTUAL CO READING MINUS ACTUAL $O_2$ READING) | | | | | | | 81.9 % | 28/100 | 22.932 |
| $N_2$ (NET IS 100 MINUS ACTUAL CO READING) | | | | | | | | 28/100 | |
| | | | | | | | | TOTAL | 29.612 |

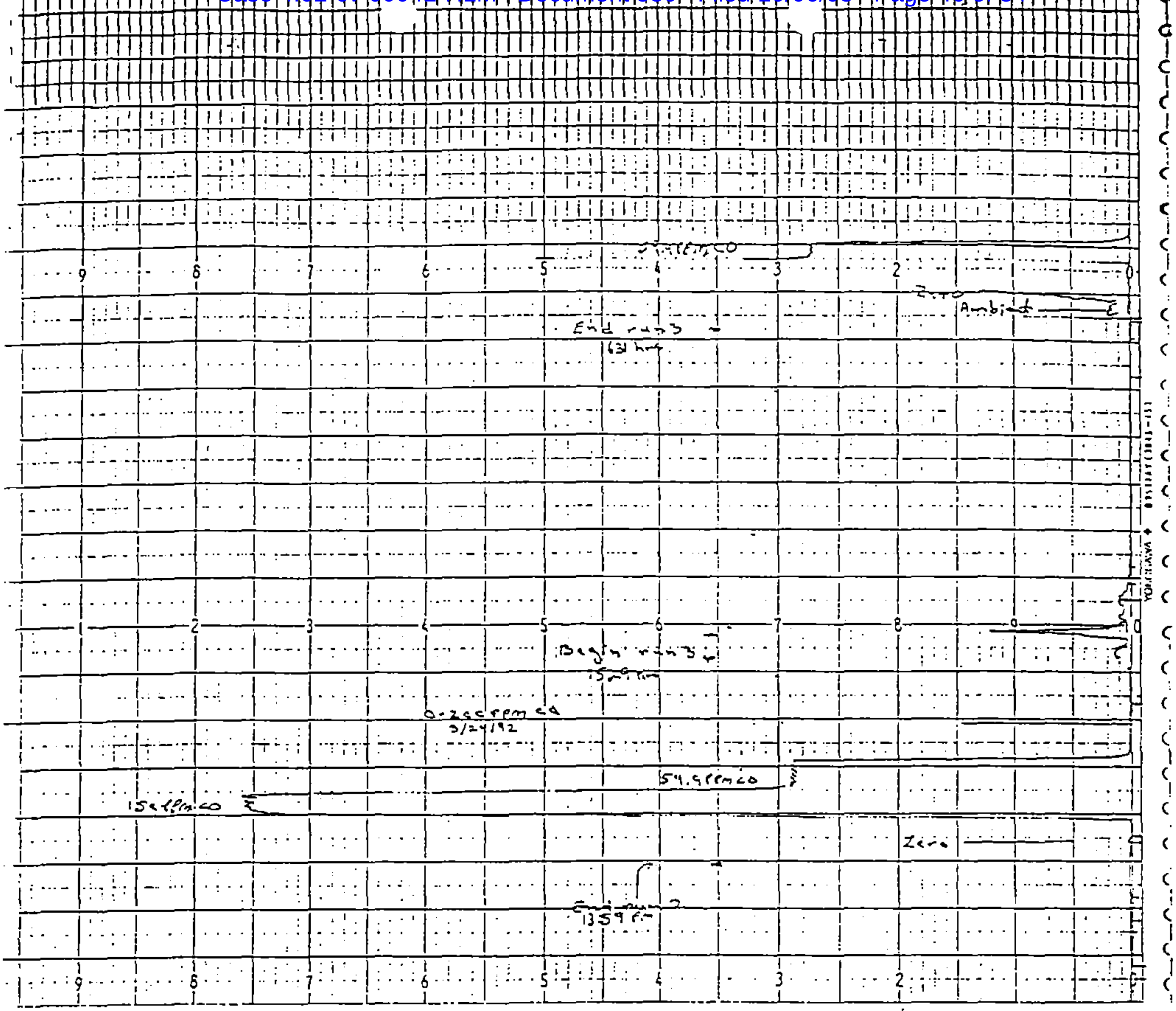
# Southern Environmental Sciences, Inc.

## GAS ANALYSIS DATA FORM

PLANT Industrial Equipment & Engineering Co.
DATE 3/24/92 TEST NO 3
SAMPLING TIME (24-hr CLOCK) 1529-1631
SAMPLING LOCATION Stack
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) Integrated bag
ANALYTICAL METHOD Orsat
AMBIENT TEMPERATURE 75°F
OPERATOR B. Nelson

COMMENTS:

| GAS \ RUN | 1 | | 2 | | 3 | | AVERAGE NET VOLUME | MULTIPLIER | MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) $M_d$ |
|---|---|---|---|---|---|---|---|---|---|
| | ACTUAL READING | NET | ACTUAL READING | NET | ACTUAL READING | NET | | | |
| $CO_2$ | 7.3 | 7.3 | 7.2 | 7.2 | 7.3 | 7.3 | 7.3% | 44/100 | 3.212 |
| $O_2$ (NET IS ACTUAL $O_2$ READING MINUS ACTUAL $CO_2$ READING) | 18.1 | 10.8 | 18.1 | 10.9 | 18.1 | 10.8 | 10.8% | 32/100 | 3.456 |
| CO (NET IS ACTUAL CO READING MINUS ACTUAL $O_2$ READING) | | | | | | | 81.9% | 28/100 | 22.932 |
| $N_2$ (NET IS 100 MINUS ACTUAL CO READING) | | | | | | | | 28/100 | ~~29.600~~ |
| | | | | | | | | TOTAL | 29.600 |


Ambient
End run 3
Begin run 3
0-200 ppm CO
5/24/92
54.9 ppm CO
Zero

# Southern Environmental Sciences, Inc.

## NOZZLE CALIBRATION

Date: 3/24/92 by: C. Wilson

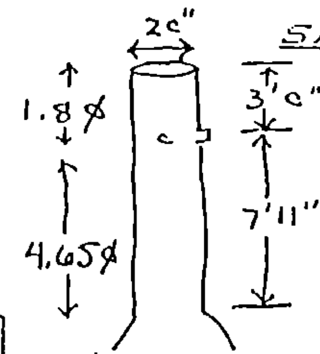
| Nozzle ID | Run no. | $D_1$ (in.) | $D_2$ (in.) | $D_3$ (in.) | $\Delta D$ (in.) | $D_a$ (in.) |
|---|---|---|---|---|---|---|
| #32 | ONE | .501 | .500 | .500 | .001 | .500 |
| #33 | 2+3 | .620 | .620 | .621 | .001 | .620 |
| | | | | | | |

where:

$D_1$, $D_2$, $D_3$ = nozzle diameter measured on a different diameter (in.). Tolerance = 0.001 in.

$\Delta D$ = maximum difference in any two measurements (in.) Tolerance = 0.004 in.

$D_a$ = average of $D_1$, $D_2$, and $D_3$




## SAMPLE POINT LOCATIONS

Company: Industrial Eqpt & Eng.
Source: Crematory
Date: 3/24/92
Duct Dia.: 20"

3" Added for port length

| Point no. | Distance from Duct wall (in.) |
|---|---|
| 1 | 3.5 |
| 2 | 4.3 |
| 3 | 5.4 |
| 4 | 6.5 |
| 5 | 8.0 |
| 6 | 10.1 |
| 7 | 15.9 |
| 8 | 18.0 |
| 9 | 19.5 |
| 10 | 20.6 |
| 11 | 21.7 |
| 12 | 22.5 |
| | |
| | |
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| | |

# POSTTEST DRY GAS METER CALIBRATION FORM

Meter Box Number: 4 Dry Gas Meter #:656687
Date:4/2/92 Pretest Y: 0.979
Barometric Pressure, Pb: 29.94

| Orifice Manometer setting (Delta H) in. H2O | Gas volume: Wet Test Meter (Vw) ft.^3 10.xxxx | Gas volume: Dry Gas Meter (Vd) ft.^3 | Temperature: Wet Test Meter (Tw) Deg F | Temperature: Dry Gas Meter Inlet (Tdi) Deg F | Temperature: Dry Gas Meter Outlet (Tdo) Deg F | Temperature: Dry Gas Meter Average (Td) Deg F | Time (Theta) min | Vacuum Setting in. Hg | Yi |
|---|---|---|---|---|---|---|---|---|---|
| 1.50 | 10.030 | 10.125 | 63.75 | | | 64.00 | 15.33 | 10.00 | 0.987 |
| 1.50 | 10.020 | 10.244 | 65.25 | | | 67.25 | 15.32 | 10.00 | 0.978 |
| 1.50 | 10.014 | 10.059 | 66.50 | | | 70.00 | 15.27 | 10.00 | 0.998 |

Y = 0.988
Diff =-0.009

$$Yi = \frac{Vw\ Pb\ (td + 460)}{Vd\ (Pb + Delta\ H/13.6)\ (Tw + 460)}$$

where

Vw = Gas Volume passing through the wet test meter, ft.^3

Vd = Gas Volume passing through the dry gas meter, ft^3

Tw = Temperature of the gas in the wet test meter, deg F.

Tdi = Temperature of the inlet gas of the dry gas meter, Deg F.

Tdo = Temperature of the outlet gas of the dry gas meter, Deg F.

Td = Average temperature of the gas in the dry gas meter, Deg F.

Delta H = Pressure differential across orifice, in. H2O.

Yi = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y +/- 0.05Y.

Pb = Barometric pressure, in. Hg.

Theta = Time of calibration run, min.

SOUTHERN ENVIRONMENTAL SCIENCES, INC.

EMISSIONS TEST CALCULATIONS

Plant: INDUSTRIAL EQUIPMENT & ENGINEERING, INC. Test Date: 3/24/92
Unit: Crematory Data Input By:
Run No: 2

$$\%I = \frac{(.09450)(Ts,°R)(Vm(std))}{(Ps)(Vs)(An)(Sample\ Time)(1-Bws)} = \frac{0.0945 * 1641.0 * 42.320}{30.13 * 20.13 * 0.002096 * 60 * 0.866}$$

$$= 99.4$$

$$As = \frac{(Stack\ Diam.,\ ft.)^{2} * 3.14159}{4} = \frac{(1.6666)^{2} * 3.14159}{4}$$

$$= 2.18$$

$$As.eff = \frac{As(total\ No.\ pts.-No.\ neg.\ pts.)}{(Total\ No.\ pts.)} = \frac{2.1816 * (24) - (0)}{(24)}$$

$$= 2.18$$

$$Q = 60(As,eff)(Vs) \quad 60 * 2.18 * 20.13$$

$$= 2634.7$$

$$Qstd = \frac{(Q)(Tstd)(Ps)(1-Bws)}{(Ts,°R)(Pstd)} = \frac{2634.69 * 528 * 30.127 * 0.8659}{1640.958 * 29.92}$$

$$= 739.2$$

$$Cs = \frac{(.01543)(mn,\ mg)}{Vm(std)} = \frac{0.01543 * 24.0400}{42.3204} = 0.009$$

$$PMR = \frac{(Cs)(Qstd)(60}{7000} = \frac{0.009 * 739.1655 * 60}{7000} = 0.0555$$

Emissions calculations in emissions test summary may differ slightly
from example calculations due to rounding of some numbers in example

KRR

THERMOMETER CALIBRATIONS

Calibrated By CHARLES R. WILSON

| Date | ID No. | Type | Range | ICE BATH | | | TEPID WATER | | | BOILING WATER | | | HOT OIL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | STD Therm | Temp. | % or ° Diff. | STD Therm | Temp. | % or ° Diff. | STD Therm | Temp. | % or ° Diff. | STD Therm | Temp. | % or ° Diff. |
| 4/12/91 | TP-3 | PT | Dig | 40 | 40 | 0° | 83 | 82 | 1° | 211 | 210 | 1° | 402 | 398 | 4° |
| 4/12/91 | TP-2 | PT | Dig | 40 | 42 | 2° | 82 | 84 | 2° | 206 | 209 | 3° | 394 | 396 | 2° |
| 4/12/91 | TP-15 | PT | Dig | 42 | 40 | 2° | 84 | 82 | 2° | 210 | 212 | 2° | 396 | 394 | 2° |
| 4/12/91 | TP-65 | PT | Dig | 39 | 39 | 0° | 84 | 82 | 2° | 214 | 212 | 2° | 419 | 414 | 5° |
| 4/12/91 | TP-8 | PT | Dig | 40 | 38 | 2° | 85 | 82 | 3° | 212 | 210 | 2° | 395 | 398 | 3° |
| 4/12/91 | TP-10 | PT | Dig | 38 | 36 | 2° | 87 | 85 | 2° | 212 | 210 | 2° | 381 | 380 | 1° |
| 4/12/91 | BT SS211 | BT | 0-220F | 34 | 36 | 2° | 76 | 79 | 3° | | | | | | |
| 4/12/91 | BT SS110 | BT | 0-220F | 38 | 38 | 0° | 76 | 76 | 0° | | | | | | |
| 4/12/91 | BT SS300 | BT | Dig | 36 | 37 | 1° | 80 | 78 | 2° | | | | | | |
| 4/12/91 | SS301 | BT | Dig | 36 | 36 | 0° | 88 | 85 | 3° | | | | | | |
| 4/12/91 | T1 | PT | Dig | 36 | 34 | 2° | 82 | 80 | 2° | 210 | 208 | 2° | 416 | 412 | 4° |
| 4/12/91 | T2 | PT | Dig | 35 | 36 | 1° | 82 | 80 | 2° | 211 | 208 | 3° | 408 | 404 | 4° |
| 4/12/91 | T3 | PT | Dig | 37 | 36 | 1° | 82 | 80 | 2° | 210 | 208 | 2° | 408 | 406 | 2° |
| 4/12/91 | I 2 | BT | 0-220F | 30 | 32 | 2° | 78 | 80 | 2° | 204 | 206 | 2° | | | |
| 4/12/91 | I 3 | BT | 0-220F | 30 | 32 | 2° | 78 | 80 | 2° | 202 | 204 | 2° | | | |
| 4/12/91 | LCL I 4 | BT | 0-100C | 0 | 32 | 0° | 80 | 77 | 3° | 210 | 208 | 2° | | | |
| 5/13/91 | VOST DGM | PT | Dig | 38 | 38 | 0° | 84 | 85 | 1° | 205 | 207 | 2° | | | |

Quality Control Limits:

Liquid in Glass Thermometers (L/G)-2%, Bimetalic Thermometers (Bm)-5°F, Pyrometers/Thermocouples (PT)-5°F

Southern Environmental Sciences, Inc.
1204 North Wheeler Street Plant City, Florida 33566-2354 (813) 752-5014

## NOMENCLATURE USED IN STACK SAMPLING CALCULATIONS (Continued)

| | |
|---|---|
| $T_{std}$ | = Standard absolute temperature, 528 °R |
| $V_a$ | = Volume of sample aliquot titrated, ml |
| $V_{lc}$ | = Liquid collected in impingers and silica gel, grams |
| $V_m$ | = Sample volume at meter conditions, DCF |
| $V_{m(std)}$ | = Sample volume at standard conditions, DSCF |
| $V_s$ | = Stack gas velocity, ft/sec |
| $V_{soln}$ | = Total volume of solution, ml |
| $V_t$ | = Volume of barium perchlorate titrant used for the sample, ml |
| $V_{tb}$ | = Volume of barium perchlorate titrant used for the blank, ml |
| $V_{w(std)}$ | = Volume of water vapor in sample corrected to standard conditions, SCF |
| Y | = Dry gas meter calibration factor |
| 13.6 | = Specific gravity of mercury |

Aycock Funeral Home

Florida Department of Environmental Regulation

Twin Towers Office Bldg. 2600 Blair Stone Road Tallahassee, Florida 32399-2400

| | |
|---|---|
| DER Form | 17-210.900(4) |
| Form Title | Annual Operating Report |
| Effective Date | March 1, 1993 |
| DER Application No. | |
| | (Filled in by DER) |

DIVISION OF AIR RESOURCES MANAGEMENT

ANNUAL OPERATING REPORT FOR AIR POLLUTION EMITTING FACILITY

See Instructions for Form 17-210.900(4).
(Note: Shaded fields on form are for DER use; please leave blank.)

REPORT INFORMATION

| 1. Year of Report | 2. Date Report Received | 3. Number of Sources in Report |
|---|---|---|
| 1993 | | 1 |

FACILITY INFORMATION (AIR020)

| 1. Facility APIS ID | 2. Facility Status | 3. Date of Permanent Facility Shutdown |
|---|---|---|
| | A | |

| 4. Facility Owner/Company Name |
|---|
| Aycock Funeral Home |

| 5. Facility Name/Street Address or Location Description |
|---|
| 505 South Federal Highway |

| 6. Facility City | County |
|---|---|
| Stuart | Martin |

| 7. Facility Compliance Tracking Codes | CDS | VOC |
|---|---|---|
| | | |

| 8. Facility Comment (60 Characters) |
|---|
| |

FACILITY HISTORY INFORMATION (AIR022)

| 1. Change in Facility Name During Year? | Previous Name | Date of Change |
|---|---|---|
| No | | |

Shaded areas are for DER use.



Date:__________

| | | | | | |
|---|---|---|---|---|---|
| APIS ID | District | Office | County | Facility | INPUT |

OWNER/CONTACT INFORMATION (AIR021)

1. Individual Owner or Authorized Representative
Name
**Mr. Ronald L. Shaw, General Manager**

Organization/Firm
**Aycock Funeral Home**

Street Address or P.O. Box
**505 South Federal Highway**

| City | State | Zip |
|---|---|---|
| **Stuart** | **Florida** | **34994** |

Telephone
**( 407 ) 287-1717**

2. Facility Contact for Air Regulatory Matters
Name
**Mr. Ronald J. Swift**

Organization/Firm
**Same as above**

Street Address or P.O. Box

| City | State | Zip |
|---|---|---|
| | | |

Telephone
( )

CERTIFICATION

Statement by Owner or Authorized Representative

I hereby certify that the information given in this report is correct to the best of my knowledge.

Signature **Ron Shaw** Date 2/9/94

Shaded areas are for DER use.

| | District | Office | County | Facility | Source | |
|---|---|---|---|---|---|---|
| APIS ID | | | | | | INPUT |

SOURCE OPERATION REPORT - PAGE 1 & 2 (SOURCE REPORT 1 OF 1 )

FACILITY NAME: Aycock Funeral Home

SOURCE INFORMATION (AIR030)

| | | | |
|---|---|---|---|
| 1. Source Description<br><br>**Industrial Equipment and Engineering Model IE43-PPPII Crematory** | | | |
| 2. DER Permit or PPS Number<br><br>**AO43-226856** | 3. Source APIS ID | | 4. Source Status<br><br>**A** |
| 5. Source Startup Date (MM/DD/YY)<br>**N/A** | | 6. Source Shutdown Date (MM/DD/YY)<br>**N/A** | |

SOURCE EMISSIONS POINT/CONTROL INFORMATION (AIR033)

| |
|---|
| 1. Source Emission Point Type<br><br>**1 (Stack)** |
| 2a. Description of Control Equipment 'a'<br><br>**Secondary Combustion Chamber (Integrated)** |
| 2b. Description of Control Equipment 'b' |

SOURCE OPERATING SCHEDULE

| | | | | | |
|---|---|---|---|---|---|
| 1. Operated During Year?<br><br>**Y** | 2. Average Operation During Year | hour/day<br><br>**6** | day/week<br><br>**7** | 3. Total Operation During Year (hour/year)<br>**2153[1]** | |
| 4. Percent Hour of Operation by Season | | DJF | MAM | JJA | SON |

Shaded ares are for DER use.

(1) = **861 Actual Cremations/year X 2.5 hrs/cremation = 2,153 hours/year**



Date:__________

| APIS ID | District | Office | County | Facility | Source | INPUT |
|---|---|---|---|---|---|---|
| | | | | | | |

SOURCE PROCESS/FUEL INFORMATION (AIR050)

| 1a. SCC 'a' | 2a. Description of Process or Type of Fuel<br>**Propane** | |
|---|---|---|
| 3a. Annual Process of Fuel Usage Rate (SCC Units)<br>**23.7 X 10³ gal** | | |
| 4a. Fuel Average % Sulfur<br>**Neg** | 5a. Fuel Average % Ash<br>**Neg** | 6a. Fuel Heat Content (mmBtu/SCC Units)<br>**91.0 mmBtu/10³ gal** |

| 1b. SCC 'b' | 2b. Description of Process or Type of Fuel<br>**Type IV Waste** | |
|---|---|---|
| 3b. Annual Process or Fuel Usage Rate (SCC Units)<br>$(861\ cremations/year)\ X\ (150\ lbs/cremation\ avg.)\left(\frac{1\ ton}{2000\ lb}\right) = 65\ TPY$ | | |
| 4b. Fuel Average % Sulfur<br>**Neg** | 5b. Fuel Average % Ash<br>**2% avg (bones and bottom ash)** | 6. Fuel Heat Content (mmBtu/SCC Units)<br>**2.0 mmBtu/ton** |

| 1b. SCC 'c' | 2c. Description of Process or Type of Fuel | |
|---|---|---|
| 3c. Annual Process or Fuel Usage Rate (SCC Units) | | |
| 4c. Fuel Average % Sulfur | 5c. Fuel Average % Ash | 6c. Fuel Heat Content (mmBtu/SCC Units) |

| 1d. SCC 'd' | 2d. Description of Process or Type of Fuel | |
|---|---|---|
| 3d. Annual Process or Fuel Usage Rate (SCC Units) | | |
| 4d. Fuel Average % Sulfur | 5d. Fuel Average % Ash | 6d. Fuel Heat Content (mmBtu/SCC Units) |

Shaded areas are for DER use.

| APIS ID | District | Office | County | Facility | Source | INPUT |
|---|---|---|---|---|---|---|
| | | | | | | |

SOURCE OPERATION REPORT - PAGE 3 & 4 (SOURCE REPORT 1 OF 1 )

SOURCE DESCRIPTION: Incinerator Stack

SOURCE EMISSIONS INFORMATION (AIR051)

| 1a. Pollutant 'a' ID | 2a. Annual Emissions (ton/year) | 3a. Emissions Method Code |
|---|---|---|
| **PM** | **0.09 TPY** | **Results from 3/24/92 Stack Test on identical unit** |

4a. Emissions Calculation

$$(0.087\ lb\ PM/hr)(2153\ hrs/yr)\left(\frac{1\ ton}{2000\ lb}\right) = 0.09\ TPY$$

**NOTE: Emission Rate based on Identical As In Construction Application**

| 1b. Pollutant 'b' ID | 2b. Annual Emissions (ton/year) | 3b. Emissions Method Code |
|---|---|---|
| **$NO_x$** | **0.17 TPY** | **AP-42, Table 1.5-1** |

4b. Emissions Calculation

$$(23.7\ X\ 10^3\ gal/yr)(14\ lb/10^3\ gal)\left(\frac{1\ ton}{2000\ lb}\right) = 0.17\ TPY$$

| 1c. Pollutant 'c' ID | 2c. Annual Emissions (ton/year) | 3c. Emissions Method Code |
|---|---|---|
| **CO** | **0.02 TPY** | **AP-42, Table 1.5-1** |

4c. Emissions Calculation

$$(23.7\ X\ 10^3\ gal/yr)(1.9\ lb/10^3\ gal)\left(\frac{1\ ton}{2000\ lb}\right) = 0.02 TPY$$

| 1d. Pollutant 'd' ID | 2d. Annual Emissions (ton/year) | 3d. Emissions Method Code |
|---|---|---|
| **Total Organic Compounds** | **0.01 TPY** | **AP-42, Table 1.5-1** |

4d. Emissions Calculation

$$(23.7\ X\ 10^3 gal/yr)(0.5\ lb/10^3\ gal)\left(\frac{1\ ton}{2000\ lb}\right) = 0.01\ TPY$$

Shaded areas are for DER use.

| APIS ID | District | Office | County | Facility | Source | INPUT |
|---|---|---|---|---|---|---|
| | | | | | | |

SOURCE EMISSIONS INFORMATION (Continued)

| 1e. Pollutant 'e' ID | 2e. Annual Emissions (ton/year) | 3e. Emissions Method Code |
|---|---|---|
| 4e. Emissions Calculation | | |

| 1f. Pollutant 'f' ID | 2f. Annual Emissions (ton/year) | 3f. Emissions Method Code |
|---|---|---|
| 4f. Emissions Calculation | | |

| 1g. Pollutant 'g' ID | 2g. Annual Emissions (ton/year) | 3g. Emissions Method Code |
|---|---|---|
| 4g. Emissions Calculation | | |

| 1h. Pollutant 'h' ID | 2h. Annual Emissions (ton/year) | 3h. Emissions Method Code |
|---|---|---|
| 4h. Emissions Calculation | | |

| 5. Source Operation Report Comments |
|---|
| |

Shaded areas are for DER use.

| APIS ID | District | Office | County | Facility | Source | INPUT |
|---|---|---|---|---|---|---|
| | | | | | | |

SOURCE OZONE-SIP REPORT - PAGE 5 & 6 (SOURCE REPORT ___ OF ___)

SOURCE DESCRIPTION:______________________________

SOURCE OZONE-SIP PROCESS/FUEL INFORMATION (AIR052)

| 1. Existing 12/31/90? | 2. Average Operation for Ozone Season (June thru August) | hour/day | day/week |
|---|---|---|---|

| 3a. SCC 'a' | 4a. Description of Process or Type of Fuel | |
|---|---|---|
| 5a. Daily Ozone Season Process or Fuel Usage Rate (SCC Units) | | |
| 6a. Emission Factor (lbs/SCC Unit) | VOC | $NO_x$ |
| 7a. Comments | | |

| 3a. SCC 'b' | 4b. Description of Process or Type of Fuel | |
|---|---|---|
| 5b. Daily Ozone Season Process or Fuel Usage Rate (SCC Units) | | |
| 6b. Emission Factor (lbs/SCC Unit) | VOC | $NO_x$ |
| 7b. Comments | | |

Shaded areas are for DER use.



Date:________

| | District | Office | County | Facility | Source | |
|---|---|---|---|---|---|---|
| APIS ID | | | | | | INPUT |

SOURCE OZONE SIP EMISSIONS INFORMATION (AIR053)

| 1a. Pollutant VOC | 2b. Ozone Season Emissions (lb/day) | 3b. Emissions Method Code |
|---|---|---|
| 4b. Emissions Calculation | | |

| IA. Pollutant $NO_x$ | 2b. Ozone Season Emissions (lb/day) | 3b. Emissions Method Code |
|---|---|---|
| 4b. Emissions Calculation | | |

Shaded Areas for DER Use.



Date: ________

**Attachment 1**

**Production Data Documentation**

# AYCOCK FUNERAL HOMES

January 13, 1994

Attached is the signed proposal authorizing you to complete our AOR. The following information is provided to assist you:

Number of cremations for 1993: 861
Fuel usage for 1993: 23,678 gallons for LP fuel
Hours of operation: approximately 6 hours day, 7 days a week
The unit operated each month of 1993.

If I can be of further assistance, please call me at (407) 287-1717.

Sincerely,

Ronald J. Swift
Crematory Manager

RECEIVED
JAN 19 1994
GROVE SCIENTIFIC COMPANY

[illegible] MILITARY TRAIL
JUPITER, FLORIDA 33458
PHONE (407) 746-[illegible]

505 SOUTH FEDERAL HIGHWAY
STUART, FLORIDA 34994
PHONE (407) 287-1717

950 N.E. JENSEN BEACH BOULEVARD
JENSEN BEACH, FLORIDA 34957
PHONE (407) 334-1200

1504 S.E. FLORESTA DRIVE
PORT ST. LUCIE, FLORIDA 34983
PHONE (407) 373-0049

# Attachment 2

## Particulate Emissions Data

# T LE 1. EMISSIONS TEST SUM RY

Company: INDUSTRIAL EQUIPMENT & ENGINEERING CO., INC.
Source: Power-Pak II Crematory - Model IE43-PPII

| | Run 1 | Run 2 | Run 3 |
|---|---|---|---|
| Date of Run | 3/24/92 | 3/24/92 | 3/24/92 |
| Process Rate (lb./hr.) | 215 | 166 | 142 |
| Start Time (24-hr. clock) | 1010 | 1257 | 1529 |
| End Time (24-hr. clock) | 1113 | 1359 | 1631 |
| Vol. Dry Gas Sampled Meter Cond. (DCF) | 32.337 | 43.827 | 43.274 |
| Gas Meter Calibration Factor | 0.979 | 0.979 | 0.979 |
| Barometric Pressure at Barom. (in. Hg.) | 30.11 | 30.13 | 30.07 |
| Elev. Diff. Manom. to Barom. (ft.) | 0 | 0 | 0 |
| Vol. Gas Sampled Std. Cond. (DSCF) | 31.438 | 42.320 | 41.761 |
| Vol. Liquid Collected Std. Cond. (SCF) | 4.536 | 6.554 | 5.385 |
| Moisture in Stack Gas (% Vol.) | 12.6 | 13.4 | 11.4 |
| Molecular Weight Dry Stack Gas | 29.61 | 29.59 | 29.60 |
| Molecular Weight Wet Stack Gas | 28.15 | 28.04 | 28.28 |
| Stack Gas Static Press. (in. H2O gauge) | -0.03 | -0.03 | -0.03 |
| Stack Gas Static Press. (in. Hg. abs.) | 30.11 | 30.13 | 30.07 |
| Average Square Root Velocity Head | 0.198 | 0.201 | 0.199 |
| Average Orifice Differential (in. H2O) | 1.016 | 1.942 | 1.903 |
| Average Gas Meter Temperature (°F) | 76.4 | 81.6 | 80.3 |
| Average Stack Gas Temperature (°F) | 926.8 | 1181.0 | 1188.1 |
| Pitot Tube Coefficient | 0.84 | 0.84 | 0.84 |
| Stack Gas Vel. Stack Cond. (ft./sec.) | 18.17 | 20.13 | 19.66 |
| Effective Stack Area (sq. ft.) | 2.18 | 2.18 | 2.18 |
| Stack Gas Flow Rate Std. Cond. (DSCFM) | 796 | 739 | 741 |
| Stack Gas Flow Rate Stack Cond. (ACFM) | 2,379 | 2,635 | 2,599 |
| Net Time of Run (min.) | 60 | 60 | 60 |
| Nozzle Diameter (in.) | 0.500 | 0.620 | 0.620 |
| Percent Isokinetic | 105.3 | 99.4 | 97.8 |
| Propane Gas Usage (MMBTU/hr.) | 1.38 | 1.26 | 1.44 |
| Particulate Collected (mg.) | 38.6 | 24.0 | 28.6 |
| Particulate Emissions (lb./hr.) 0.08 lb/hr | 0.13 | 0.06 | 0.07 |
| Particulate Emissions (gr./DSCF) | 0.019 | 0.009 | 0.011 |
| Particulate Emissions (gr./DSCF @ 7% $O_2$) | 0.026 | 0.012 | 0.015 |
| Avg. Particulate Emissions (gr./DSCF @ 7% $O_2$) | | 0.018 | |
| Allowable Part. Emissions (gr./DSCF @ 7% $O_2$) | | 0.100 | |
| CO Emissions (ppm) | 2.8 | 0.5 | 0.7 |
| CO Emissions (ppm @ 7% $O_2$) | 3.8 | 0.7 | 1.0 |
| Avg. CO Emissions (ppm @ 7% $O_2$) | | 1.8 | |
| Allowable CO Emissions (ppm @ 7% $O_2$) | | 100 | |

Note: Standard conditions 68°F, 29.92 in. Hg

**Attachment 3**

**AP- 42 Table 1.5-1**

## 1.5 LIQUIFIED PETROLEUM GAS COMBUSTION

### 1.5.1 General[1]

Liquified petroleum gas (LPG) consists of butane, propane, or a mixture of the two, and of trace amounts of propylene and butylene. This gas, obtained from oil or gas wells as a gasoline refining byproduct, is sold as a liquid in metal cylinders under pressure and, therefore, is often called bottled gas. Liquified petroleum gas is graded according to maximum vapor pressure, with Grade A being mostly butane, Grade F mostly propane, and Grades B through E being varying mixtures of butane and propane. The heating value of LPG ranges from 6,480 kcal/liter (102,000 Btu/gallon) for Grade A to 6,030 kcal/liter (91,000 Btu/gallon) for Grade F. The largest market for LPG is the domestic/commercial market, followed by the chemical industry and internal combustion engines.

### 1.5.2 Emissions and Controls[1-4]

Liquified petroleum gas is considered a "clean" fuel because it does not produce visible emissions. However, gaseous pollutants such as carbon monoxide (CO), organic compounds, and nitrogen oxides ($NO_x$) do occur. The most significant factors affecting these emissions are burner design, burner adjustment, and flue gas venting. Improper design, blocking and clogging of the flue vent, and insufficient combustion air result in improper combustion and the emissions of aldehydes, CO, hydrocarbons, and other organics. Nitrogen oxide emissions are a function of a number of variables, including temperature, excess air, fuel/air mixing, and residence time in the combustion zone. The amount of sulfur dioxide ($SO_2$) emitted is directly proportional to the amount of sulfur in the fuel. Emission factors for LPG combustion are presented in Tables 1.5-1 and 1.5-2.

Nitrogen oxides are the only pollutant for which emission controls have been developed. Propane and butane are being used in Southern California as backup fuel to natural gas, replacing distillate oil in this role pursuant to the phaseout of fuel oil in that region. Emission control for $NO_x$ have been developed for firetube and watertube boilers firing propane or butane. Vendors are now warranting retrofit systems to levels as low as 30 to 40 ppm (based on 3 percent oxygen). These low-$NO_x$ systems use a combination of low $NO_x$ burners and flue gas recirculation. Some burner vendors use water or steam injection into the flame zone for $NO_x$ reduction. This is a trimming technique which may be necessary during backup fuel periods because LPG typically has a higher $NO_x$-forming potential than natural gas; conventional natural gas emission control systems may not be sufficient to reduce LPG emissions to mandated levels. Also, LPG burners are more prone to sooting under the modified combustion conditions required for low $NO_x$ emissions. The extent of allowable combustion modifications for LPG may be more limited than for natural gas.

One $NO_x$ control system that has been demonstrated on small commercial boilers is flue gas recirculation (FGR). Nitrogen oxide emissions from propane combustion can be reduced by as much as 50 percent by recirculating 16 percent of the flue gas. Nitrogen oxide emission reductions of over 60 percent have been achieved with FGR and low $NO_x$ burners used in combination.

TABLE 1.5-1. (ENGLISH UNITS) EMISSION FACTORS FOR LPG COMBUSTION[a,b]
(Emission Factor Rating: E)

| Pollutant | Butane Emission Factor lb/1000 gal | | Propane Emission Factor lb/1000 gal | |
|---|---|---|---|---|
| | Industrial Boilers[c] | Commercial Boilers[d] | Industrial Boilers[c] | Commercial Boilers[d] |
| Filterable particulate matter[e] | 0.6 | 0.5 | 0.6 | 0.4 |
| Sulfur oxides[f] | 0.09s | 0.09s | 0.10s | 0.10s |
| Nitrogen oxides[g] | 21 | 15 | 19 | 14 |
| Carbon dioxide | 14,700 | 14,700 | 12,500 | 12,500 |
| Carbon monoxide | 3.6 | 2.1 | 3.2 | 1.9 |
| Total organic compounds | 0.6 | 0.6 | 0.5 | 0.5 |

a. Assumes emissions (except $SO_x$ and $NO_x$) are the same, on a heat input basis, as for natural gas combustion. The $NO_x$ emission factors have been multiplied by a correction factor of 1.5 which is the approximate ratio of propane/butane $NO_x$ emissions to natural gas $NO_x$ emissions.

b. SCC Codes 102101001, and 10301001 for industrial and commercial/institutional butane combustion. SCC Codes 10201002, and 10301002 for industrial and commercial/institutional propane combustion. SCC Codes 10500110, and 10500210 for industrial and commercial/institutional LPG combustion.

c. Heat input capacities generally between 10 and 100 million Btu/hour.

d. Heat input capacities generally between 0.3 and 10 million Btu/hour.

e. Filterable particulate matter (PM) is that PM collected on or prior to the filter of an EPA Method 5 (or equivalent) sampling train.

f. Expressed as $SO_2$. S equals the sulfur content expressed on gr/100 $ft^3$ gas vapor. For example, if the butane sulfur content is 0.18 gr/100 $ft^3$ emission factor would be (0.09 x 0.18=) 0.016 lb of $SO_2$/1000 gal butane burned.

g. Expressed as $NO_2$.

Florida Departi. .nt of Environmental Regula..n

Twin Towers Office Bldg. 2600 Blair Stone Road Tallahassee, Florida 32399-2400

| | |
|---|---|
| DER Form | 17-210.900(4) |
| Form Title | Annual Operating Report |
| Effective Date | March 1, 1993 |
| DER Application No. | |
| | (Filled in by DER) |

DIVISION OF AIR RESOURCES MANAGEMENT

ANNUAL OPERATING REPORT FOR AIR POLLUTION EMITTING FACILITY

See Instructions for Form 17-210.900(4).
(Note: Shaded fields on form are for DER use; please leave blank.)

REPORT INFORMATION

| 1. Year of Report | 2. Date Report Received | 3. Number of Sources in Report |
|---|---|---|
| 1992 | | 1 |

FACILITY INFORMATION (AIR020)

| 1. Facility APIS ID | 2. Facility Status | 3. Date of Permanent Facility Shutdown |
|---|---|---|
| | A | |
| 4. Facility Owner/Company Name | | |
| Aycock Funeral Home | | |
| 5. Facility Name/Street Address or Location Description | | |
| 505 South Federal Highway | | |
| 6. Facility City | | County |
| Stuart | | Martin |
| 7. Facility Compliance Tracking Codes | CDS | VOC |
| 8. Facility Comment (60 Characters) | | |

FACILITY HISTORY INFORMATION (AIR022)

| 1. Change in Facility Name During Year? | Previous Name | Date of Change |
|---|---|---|
| No | | |

Shaded areas are for DER use.

| District | Office | County | Facility | |
|---|---|---|---|---|
| APIS ID | | | | INPUT |

OWNER/CONTACT INFORMATION (AIR021)

| | | |
|---|---|---|
| 1. Individual Owner or Authorized Representative<br>Name<br>Mr. Ronald L. Shaw, General Manager | | |
| Organization/Firm<br>Aycock Funeral Home | | |
| Street Address or P.O. Box<br>505 South Federal Highway | | |
| City<br>Stuart | State<br>Florida | Zip<br>34994 |
| Telephone<br>( 407 ) 287-1717 | | |
| 2. Facility Contact for Air Regulatory Matters<br>Name<br>Mr. Ronald J. Swift | | |
| Organization/Firm<br>Same as above | | |
| Street Address or P.O. Box | | |
| City | State | Zip |
| Telephone<br>( ) | | |

CERTIFICATION

Statement by Owner or Authorized Representative

I hereby certify that the information given in this report is correct to the best of my knowledge.

Signature: [signature] Date: 4/12/93

Shaded areas are for DER use.

| | District | Office | County | Facility | Source | INPUT |
|---|---|---|---|---|---|---|
| APIS ID | | | | | | |

SOURCE OPERATION REPORT - PAGE 1 & 2 (SOURCE REPORT 1 OF 1)

FACILITY NAME: Aycock Funeral Home

SOURCE INFORMATION (AIR030)

| | | |
|---|---|---|
| 1. Source Description<br><br>Crematory | | |
| 2. DER Permit or PPS Number<br><br>AC43-219869 | 3. Source APIS ID | 4. Source Status<br><br>A |
| 5. Source Startup Date (MM/DD/YY)<br>12/23/92 | 6. Source Shutdown Date (MM/DD/YY) | |

SOURCE EMISSIONS POINT/CONTROL INFORMATION (AIR033)

| |
|---|
| 1. Source Emission Point Type<br><br>1 (Stack) |
| 2a. Description of Control Equipment 'a'<br><br>Secondary Combustion Chamber (Integrated) |
| 2b. Description of Control Equipment 'b' |

SOURCE OPERATING SCHEDULE

| | | | | | |
|---|---|---|---|---|---|
| 1. Operated During Year?<br><br>Y | 2. Average Operation During Year | hour/day<br><br>6 | day/week<br><br>7 | 3. Total Operation During Year (hour/year)<br>38 | |
| 4. Percent Hour of Operation by Season | | DJF | MAM | JJA | SON<br><br>* |

Shaded ares are for DER use.

* Cremator only operated during December 1992.

DER Form 17-210.900(4) - Page 1
Effective:

Date:___________

| District | Office | County | Facility | Source | INPUT |
|---|---|---|---|---|---|
| APIS ID | | | | | |

SOURCE PROCESS/FUEL INFORMATION (AIR050)

| 1a. SCC 'a' | 2a. Description of Process or Type of Fuel<br>Propane | |
|---|---|---|
| 3a. Annual Process of Fuel Usage Rate (SCC Units)<br>0.475 x $10^3$ gal | | |
| 4a. Fuel Average % Sulfur<br>Neg | 5a. Fuel Average % Ash<br>Neg | 6a. Fuel Heat Content (mmBtu/SCC Units)<br>91.0 mmBtu/$10^3$ gal |

| 1b. SCC 'b' | 2b. Description of Process or Type of Fuel<br>Type IV Waste | |
|---|---|---|
| 3b. Annual Process or Fuel Usage Rate (SCC Units)<br>1.66 ton | | |
| 4b. Fuel Average % Sulfur<br>Neg | 5b. Fuel Average % Ash<br>2% avg (bones and bottom ash) | 6. Fuel Heat Content (mmBtu/SCC Units)<br>2.0 mmBtu/ton |

| 1b. SCC 'c' | 2c. Description of Process or Type of Fuel | |
|---|---|---|
| 3c. Annual Process or Fuel Usage Rate (SCC Units) | | |
| 4c. Fuel Average % Sulfur | 5c. Fuel Average % Ash | 6c. Fuel Heat Content (mmBtu/SCC Units) |

| 1d. SCC 'd' | 2d. Description of Process or Type of Fuel | |
|---|---|---|
| 3d. Annual Process or Fuel Usage Rate (SCC Units) | | |
| 4d. Fuel Average % Sulfur | 5d. Fuel Average % Ash | 6d. Fuel Heat Content (mmBtu/SCC Units) |

Shaded areas are for DER use.



Date:__________

| | District | Office | County | Facility | Source | |
|---|---|---|---|---|---|---|
| APIS ID | | | | | | INPUT |

SOURCE OPERATION REPORT - PAGE 3 & 4 (SOURCE REPORT 1 OF 1)

SOURCE DESCRIPTION: Incinerator Stack

SOURCE EMISSIONS INFORMATION (AIR051)

| 1a. Pollutant 'a' ID | 2a. Annual Emissions (ton/year) | 3a. Emissions Method Code |
|---|---|---|
| PM | 0.002 TPY | Results from 3/24/92 Stack Test on identical unit |

4a. Emissions Calculation

$$0.087\,lb\,PM/hr\,(38hr/yr)\left(\frac{1}{2000}\right)=0.002\,TPY$$

NOTE: Emission Rate based on Identical As In Construction Application

| 1b. Pollutant 'b' ID | 2b. Annual Emissions (ton/year) | 3b. Emissions Method Code |
|---|---|---|
| NOX | 0.002 TPY | AP-42, Table 2.1-1 |

4b. Emissions Calculation

$$3\,lb/ton\,(1.66\,TPY)\left(\frac{1}{2000}\right)=0.002\,TPY$$

| 1c. Pollutant 'c' ID | 2c. Annual Emissions (ton/year) | 3c. Emissions Method Code |
|---|---|---|
| CO | Neg | AP-42, Table 1.5-1 Domestic/Commercial |

4c. Emissions Calculation

$$1.8\,lb/10^3gal\,(.475x10^3gal)\left(\frac{1}{2000}\right)=0.0004\,TPY$$

| 1d. Pollutant 'd' ID | 2d. Annual Emissions (ton/year) | 3d. Emissions Method Code |
|---|---|---|
| VOC (nonmethane) | Neg | AP-42, Table 1.5-1 Domestic/Commercial |

4d. Emissions Calculation

$$0.47\,lb/10^3gal\,(.475x10^3gal)\left(\frac{1}{2000}\right)=0.0001\,TPY$$

Shaded areas are for DER use.



Date:

# Ronald J. Swift

Luis,

Attached is the Authorization to Proceed, the original 1992 Annual Operation Report received from DER, and copies of the Application for Operating Permit submitted for the new unit.

Additional information:

Number of cremations in 1992 - 849

Approximate gas usage - 23,000 gal

Amount of operation - approximately 5 hours per day, 6 days per week.

Ron Swift

3/2?/93

RECEIVED
MAR - 4 1993
GROVE SCIENTIFIC COMPANY

19
175 lb
23 → 31

16

United States District Court ★ Northern District of Georgia ★

EXHIBIT / ATTACHMENT

B

(To be scanned in place of tab)

**Luis Llorens**
President - AI Environmental Consulting Services, Inc.
Affiliated Engineer - GSC

## Education

University of Detroit
B.S. Chemical Engineering, August, 1989

## Certifications

Hazardous Waste Management
Environmental Auditor
Certified Visible Emissions Observer
Certified Incinerator Operator Instructor
HAZWOPER 40-Hour Certified; RCRA

## Professional Affiliations

Air & Waste Management Association – National
Air & Waste Management Association – Central Florida, Current recruiting Chair
American Institute of Chemical Engineers
National Funeral Director of North America
Cremation Association of North America
National Funeral Directors Association

Responsible for the creation and operation of the solid waste division which specialized in MSW, hospital, hazardous and radioactive waste. Responsible for the conceptual design and sizing calculations of proposed equipment. Also responsible for coordinating the environmental permitting of these projects. In addition, the generation of new markets in foreign countries and the recruiting of sales personnel. Also, the re-introduction of the products targeted to the death care industry in the United States.

Responsible for solid waste projects in the Bahamas, Brazil, Chile, United Kingdom, Mexico, United States and, Venezuela.

**AI Environmental Consulting and GSC Company - Project Manager/Chemical Engineer**

Prepared air operation and construction permits (including Title V), and performed emissions inventories for several industrial facilities including boat manufacturers, printing presses, asphalt batch plants, coaters, circuit board manufacturers; performed environmental audits on stationary sources for all types of environmental media including air, hazardous waste consulting, NPDES storm water permitting, and EPCRA reporting; familiar with OSHA support and H&S requirements; coordinated and managed compliance testing; managed permit tracking; marketing to clients.

**Experience:**

- Air Pollution Permitting (Title V)
- Hazardous Waste Consulting RCRA
- Extensive Background in Chemical Engineering
- Air Toxics Modeling and Permitting
- Emergency response consulting (CERCLA)
- Environmental Audits
- Due Diligence Audits
- Soil Remediation Projects

EXHIBIT
ALL-STATE LEGAL®
B1

- EPCRA Consulting
- SWPPP
- MSDS Preparation
- Ambient Monitoring
- Stack Testing

## Publications

Ferraro, B.A., , Llorens L, "Grease Laden Air & Baking Ovens" for the National Fire protection Agency

**BRUNO A FERRARO, C.E.P., Q.E.P.**
**PRESIDENT - GSC**

**Education:**

Florida Institute of Technology
B.S., Biological Sciences

**Certifications:**

- Certified environmental professional (C.E.P.)
- Qualified environmental professional (Q.E.P.)
- NIOSH-582
- Visible emission evaluator
- Certified incinerator operator instructor

**Publications:**

- Rampenthal, Scott W., Ferraro, Bruno A., 1987. *Water Quality in Central Florida's Phosphate Mineralized Region*
- *Florida Environments* - columnist
- *Florida Woods and Water* - columnist

**Experience:**

- Environmental consultant in Florida since 1979
- Broad base of experience in the field of environmental sciences and engineering
- Air pollution permitting and source testing
- Expert witness for water quality, air pollution and indoor environmental quality projects
- Former President of the Florida Society of Environmental Analysts
- Extensive professional experience in indoor air quality and industrial hygiene
- Ambient air testing, modeling and consulting

# DOUGLAS W. BAUMAN, P.E., MSE

**Expertise:** Environmental Engineering, Air Pollution, Air Pollution Control Design, Indoor Air Quality, Environmental Regulatory Compliance and Auditing, Contamination Assessment and Remediation.

**Experience:** Mr. Bauman has over 12 years of experience in the field of Environmental Engineering, a Master of Science in Engineering, and is a Florida licensed Professional Engineer. His experience was obtained as a Consulting Engineer and complimented while serving 4.5 years as Corporate Environmental Engineer for a large, heavy regulated manufacturing company based in the southeastern United States with distribution and sales centers nationwide. Mr. Bauman's environmental engineering experience is multi-media in nature. The majority of his experience is centered around air permitting and compliance at all levels, including design and troubleshooting of major air pollution control systems, regulatory compliance for industry, indoor air quality and industrial hygiene, contamination assessment, and stormwater permitting. Mr. Bauman continues to design emission inventory spreadsheets, and regulatory compliance database applications. Mr. Bauman is very active with the Florida Air and Waste Management Association.

**Related Projects/ Experience:**

Mr. Bauman is currently performing air permitting and air compliance planning for two major aircraft refurbishing and modification companies located in Florida. Mr. Bauman has several well-known clients, many of whom are Major Sources of air pollution, throughout Florida, which he provides Professional Engineering services on an ongoing basis. Much of his

. Mr. Bauman is the Registered Engineer for the Greater Orlando Aviation Authority (GOAA), managing air permitting and air quality compliance projects at both the Orlando International Airport and the Orlando Executive Airport, including an.

- Greater Orlando Aviation Authority (GOAA), Orlando, FL: Mr. Bauman has served as the Registered Professional Engineer and Industrial Hygienist managing air permitting, air compliance and indoor air quality matters for GOAA at Orlando International Airport (OIA) and Orlando Executive Airport. His responsibilities at these facilities included, but were not limited to the following:
  - Airport wide air compliance audit at both airports in 1998
  - Air pollution source permitting at OIA in 1998 and 1999,
  - Indoor air quality evaluations for numerous air port buildings and facilities, 1998and 1999,
  - Indoor Air Quality Emergency Response at OIA's main terminal in 19989; and,
  - Opacity testing (EPA Method 9) for United States Department of Agriculture's incinerator at GOAA. 1998;

- Flightstar Aircraft Services, FL: Mr. Bauman is currently performing air permitting and air compliance planning, including the development of air emissions tracking spreadsheet.

- Stillwater Technologies, Inc., Orlando, FL: Mr. Bauman has assisted this civil and environmental engineering firm/client, as the engineer of record on several air permitting and modeling projects, including:
  - Air construction permitting, Hanson Pipe & Products new concrete pipe and products plant in Apollo Beach, Florida,
  - EPA SCREEN 3 modeling, Takoradi Thermal Power Station, Takoradi, Ghana, Africa

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- Rockwell Collins, Inc., Title V Air Permit modifications and Title V renewal permitting, Melbourne, FL.
- Air pollution source permitting at OIA in 1998 and 1999,

- Crestview Aerospace Corporation, FL: Mr. Bauman is currently performing air permitting and air compliance planning, including the development of air emissions tracking spreadsheet.

- Citrus World, Aubumdale, FL: Mr. Bauman developed computer a computer application in Microsoft® Access® for client to tract toxic materials usage throughout the plant and perform calculations to assist in SARA Form R reporting. Citrus World is the largest orange processing plant in Florida.

- Regulatory Compliance: Mr. Bauman managed regulatory compliance and/or enforcement issues in Florida, California, Georgia, and Kentucky pertaining to stormwater permit compliance, California-Proposition 65, air permitting, 40 CFR - New Source Performance Standards, Subpart OOO and UUU, OSHA.

- Florida Tile Industries, Shannon, GA: Mr. Bauman performed an air permit regulatory (40 CFR-NSPS, Subpart OOO and UUU) compliance audit for a nonmetallic mineral processing plant, containing over 30 affected facilities. He mediated with the Georgia Department of Natural Resource's (DNR) Air Branch pertaining to enforcement due to noncompliance. He designed a plan, approved by Georgia DNR, to bring the manufacturing plant into compliance with the permitting regulations. Mr. Bauman managed the performance of the compliance plan's air pollution stack testing.

- Florida Tile Industries, Shannon, GA; Lakeland, Florida; Lawrenceburg, KY: Mr. Bauman completed major source (Title V) air operating permit applications for all three manufacturing plants burning over 50 million BTUs of natural gas and processing over 16 tons/hr of nonmetallic minerals.

Florida Tile Industries, Lawrenceburg, KY: Mr. Bauman managed emergency response and clean-up activities of a reportable release/discovery of approximately 4 pounds of liquid mercury near the edge of an uncovered parking area. Factors effecting emergency response included vapor concentrations, soil contamination, stormy weather, gradients, and relatively large contaminated area.

Mr. Bauman wrote and stamped spill prevention control and countermeasures (SPCC) plans for all three manufacturing plants to reduce risk of oil contamination to navigatable water of the State and to enhance emergency response in the event of an oil release.

He completed superfund amendments and reauthorization act (SARA) Form R reports, air annual operating reports, Title V fee forms, and many other forms/reports driven by environmental regulatory compliance.

Mr. Bauman served on an engineering design team responsible for the implementation of a 2.5 year, 28 million dollar manufacturing plant modernization project. He reviewed all nonmetallic minerals material handling and air pollution control system designs. He completed all applications for construction permits for new air pollution sources related to modernization and expansion project.

Mr. Bauman managed the restoration project for a 45,000-gallon per day industrial wastewater treatment system. The restoration project included the design of a temporary industrial wastewater treatment (batch process) system to allow 20% of the plant to continue to operate. The project was completed in a five-day window.

Mr. Bauman conducted an indoor air quality and air pollution control system efficiency study for the large manufacturing plant. The study included

personal monitoring of workers in 5 areas of the facility, confined space entry. The study included prioritized recommendations for improving the air quality within the plant and for reducing operating a maintenance cost for the air pollution control systems.

Mr. Bauman designed a 4,890 cfm dust collection system to control wet particulate matter emissions from glaze spraying applications.

- Florida Tile Industries, Lakeland, FL: Mr. Bauman designed a 34,000 cfm dust collection system for a nonmetallic minerals processing facility. Dust collection system included the design of more than 25 pick-up hoods.

  Mr. Bauman conducted an indoor air quality study for a Deco Room (450 square foot room where specialty tile is decaled or painted with high VOC containing paint). Study included personal monitoring and ambient air sampling.

- HITECH, Orlando, FL: Mr. Bauman performed a Phase II Environmental Assessment of a warehouse facility in Orlando Business Park. The subject site is located near well-known Ashland Chemical Plume and previously contained fuel underground storage tanks.

- ECC, Orlando, FL: Mr. Bauman conducted an emergency response at this facility after a chemical had spilled out from a trash trailer during unloading. Chemical migrated to stormwater sewer prior to first respondents' arrival at spill. Down gradient stormwater pipe was blocked, chemical was pumped to VAC truck, stormwater pipe was flushed, flush water collected and tested as non-hazardous.

- Florida Hospital, Orlando, FL: Mr. Bauman collected composite samples from medical waste incinerators for hazardous waste characterization. He completed air pollution construction permitting for facility.

- Hareldson's Auto Salvage, Kissimmee, FL: Mr. Bauman performed a Phase II Environmental Assessment of a 60-year-old salvage yard. Primary contaminant source identified as a historic portable auto crusher.

- Confidential Client, Fort Lauderdale, FL: Mr. Bauman performed indoor air quality and stack test sampling at a metal finishing facility. Additionally, he performed a building ventilation study. He developed and published emission factor equation for formaldehyde emissions from electroless copper plating operations.

- Trilectron, Clearwater, FL: He wrote NPDES stormwater pollution prevention plan (PPP) for new airport ground equipment support manufacturing facility.

**Academic Background:** Master of Science, Environmental Engineering, University of Central Florida, 1994
Bachelor of Science, Environmental Engineering, University of Central Florida, 1992

**Registrations:** Professional Engineer, State of Florida #PE 0050807
Visible Emissions Evaluator, State of Florida #249272

**Certifications:** Asbestos Accreditation under TSCA Title II/AHERA (Abatement: Project Design; Management Planning; Facility Survey and Building Systems)
OSHA 40 Hour HAZWOPER Training

**Professional Affiliations:** Florida Air and Waste Management Association
National Society of Professional Engineers
Florida Engineering Society

American Society of Civil Engineers

**Publications:** Co-author of "Atmospheric Releases of Formaldehyde From Electroless Copper Plating Operations", University of Central Florida Department of Civil and Environmental Engineering, 1993.

Co-author of "Atmospheric Releases of Hexavalent Chromium From Hard Chromium Plating Operations", University of Central Florida Department of Civil and Environmental Engineering, 1992.

## ENVIRONMENTAL ASSESSMENT
## CLIENT LIST

- Crawford Equipment & Engineering
- Baron Real Estate Services
- Post, Buckley, Schuh & Jerningan
- Mid-County Utilities
- Brunswick Defense Division
- Prudential Florida Realty
- Florida Department of Agriculture
- Spiralkote, Inc.
- City of Kissimmee
- Sonoco Products
- Florida Hospital
- Philips Circuit Assembly
- Waste Management Inc.
- Frito Lay Company
- PB&S Chemical
- Wolverine Gasket Co.
- Ringhaver Corporation
- Dunes Management Company
- Forklift World
- City of Rockledge
- D. Franklin Properties
- Westinghouse Electric
- Pillar-Bryton Partners
- Hillsborough County
- R&M Brakes Inc.
- Real Estate One - Orlando
- Lee Chemical Company
- Transfer One
- Realandco
- City of South Daytona
- ITT Defense Communications
- Superbrand Roods, Inc.
- Domino's Pizza, Camp LeJeune, N. C.
- Mercy Hospital: Laredo, Texas
- Pineloch Management Corporation
- City of Vero Beach
- U.S. Army Corps of Engineers
- Hunter Marine, Inc.
- Florida Iron Works
- First Union Bank
- Brainstorms Advertizing, Inc.
- Church of Christ
- Midland Industries
- Newspaper Printing Company
- American Asphalt Company
- Dial Septic Tank
- H & H Printing Company

AI Environmental Consulting and GSC Company currently assists over 200 companies and corporations with their environmental assessment needs. A more complete list of references can be provided upon request.

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# INDUSTRIAL HYGIENE / INDOOR ENVIRONMENTAL QUALITY CLIENT LIST

- Mason Homes
- General Services Administration (Federal Government)
- Orlando Utility Commission
- Seminole Community College
- Florida Hospital
- International Mining Corporation
- Orange County Landfill
- Flowers Chemical Laboratory
- City of Winter Springs
- Hunter Marine
- Lowndes, Drosdick, P.A.
- Maryland Casualty\Wicker Smith
- Baker and Hostettler
- The Hartford Insurance
- WCPX Channel 6 TV
- Waste Management
- City of Orlando
- Domino's Pizza
- Michael N. Bryant Contractors
- Inrecon
- Grey, Harris, and Robinson, P.A.
- Home Insurance Company
- American Automobile Association (AAA)
- WFTV Channel 9 TV
- Mechanical Services, Incorporated
- Peninsula Engineering, Inc.
- Orange County Library System
- Kendall Risk Management
- Marriott's Orlando World Center
- Martin Marietta
- Greater Construction
- Trilectron Industries, Inc.
- Grover Bryan, Inc.
- Cape Canaveral Hospital
- Land Company
- Walgreens - Orlando Distributor
- Maguire, Voorhies, P.A.
- Landmarks Group
- Travelers Insurance
- United States Postal Service
- Greater Orlando Aviation Authority

AI Environmental Consulting and GSC Company currently assists over 100 companies and corporations with their indoor environmental quality needs. A more complete list of references can be provided upon request.

**AIR POLLUTION**
**CLIENT LIST**

- Florida Hospital - Orlando
- West Volusia Memorial Hospital
- P,B, & S Chemical Company
- Quaker Oats Company
- ITT Defense Communications
- AMI Medical Center
- Central Florida Aircraft Refinishers
- Central Florida Press
- Frito Lay
- Page Avjet
- Hillsborough County Animal Control
- Sun N' Fun Printing
- Educational Computer Corp. (ECC)
- Hunter Marine
- Luhrs Corporation
- Halifax Paving
- Pensacola Naval Air Station
- McDonnell Douglas Astronautics Co.
- Group Technologies, Incorporated
- DeSoto County Landfill
- Wolverine Gasket Company
- Spiralkote
- Reedy Creek Improvement District - Power Plant
- Florida Dept. of Agriculture - Dade City
- Brunswick Defense
- Avanti Press
- Technetics Corporation
- Sea World
- University of Florida
- Medical College of Georgia
- AT&T Technologies
- Ciba-Geigy
- Florida Dept. of Agriculture - Kissimmee
- Newspaper Printing Company
- Noven Pharmaceuticals
- Vance IDS
- Sun Graphics
- Owens Corning - Auburndale
- Cooper Coil Coating
- Bertram Yacht
- The Alpha Corporation
- Hubbard Construction
- Sonoco Products
- Continental Circuits, Inc.
- American Asphalt, Inc.
- International Coating and Laminating Corp.

AI Environmental Consulting and GSC Company currently services over 100 air pollution sources throughout Florida , the United States, Chile, Brazil and, Venezuela . We have successfully permitted over 450 sources of air pollution.